

THE  
Golden Hamster  
MANUAL



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by  
Louis Clyde Gale

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## THE GOLDEN HAMSTER MANUAL

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Other Works by the Same Author—

MESOCRICETUS AURATUS

SCIENTIFIC REPORT ON THE HAMSTERS

THE LABORATORY HAMSTER MANUAL

RAISING HAMSTERS FOR SCIENCE

HOBBY HAMSTERY PENS

SCHOOL HAMSTERS

PROFITABLE HAMSTER RAISING

Publisher's profit is devoted to evangelical charity.

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*Well-Known Educator Comments*  
ON THE  
**Golden Hamster Manual**

**FOREWORD**

No other writer has done so much for the hamster industry and for laboratory users of these new animals. RAISING HAMSTERS FOR SCIENCE (1946) immediately attained the outstanding popularity it deserved. Only the man who wrote that book could have written THE GOLDEN HAMSTER MANUAL, an excellent and amazingly interesting book to be welcomed by the readers of his previous works and by countless others desiring this authentic information. THE GOLDEN HAMSTER MANUAL (1949) is not only the newest book in its field but also the most complete treatment of the entire hamster industry.

—Jesse Earl Vague, M.S. in Education.

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**INTRODUCTION**

This book has been written for those who are now raising or using hamsters and for all who are considering raising or using these creatures. Many buy the animals before acquiring adequate knowledge of their nature and usefulness. It is evident that an increasing number of inquirers desire more complete and assuring instruction in the most important phases of the hamster industry. In the interest of the pleasure and profit for the raisers, as well as the hamster's service to science, the subject matter has herein been published in as great detail as space permits, with the hope that it may be of helpful guidance to persons investigating, raising, or using the Syrian Golden Hamsters.

—L.C.G.

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Attention is called to the fact that the illustrations in this book correspond to classroom instruction black-board drawings representing essential characteristics, directions and scientific data under consideration. No effort has been made to include pet or other pictures. Some of the listed illustrations include sets of from 2 to 11 different drawings, making a total of 92 illustrations in the book.

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# I

## GENERAL INFORMATION ON THE HAMSTERS

### 1. The Value of Scientific Information

Producers and users, small and large, must have valid scientific information to succeed with hamsters. With such information, hamsters are easily and successfully raised in great numbers and are used by science with amazingly gratifying results.

There is a considerable variety in hamster raising techniques. Two men may use the same type of pens: one fail; the other succeed. Two others may use the same feeds: one fail; the other succeed. The reader may guess the answer. Yes, other factors, techniques and perhaps peculiar local circumstances may be more highly determinative than either man observes. To a marked extent, each and every hamster producer may learn by experience. Nevertheless, proper guidance is invaluable.

It is apparent that no other laboratory animal has been so victimized by erroneous claims and published misinformation as has the hamster. As soon as they have a few animals to sell, some novices pose as hamster authorities. Results of incompetent advice out of such fragmentary and amateurish knowledge have discouraged or misled many beginner producers as well as prospective users of these unique animals. Regardless, hamsters have become firmly established in laboratory usage and demand.

### 2. Hamster Genera and Physical Features

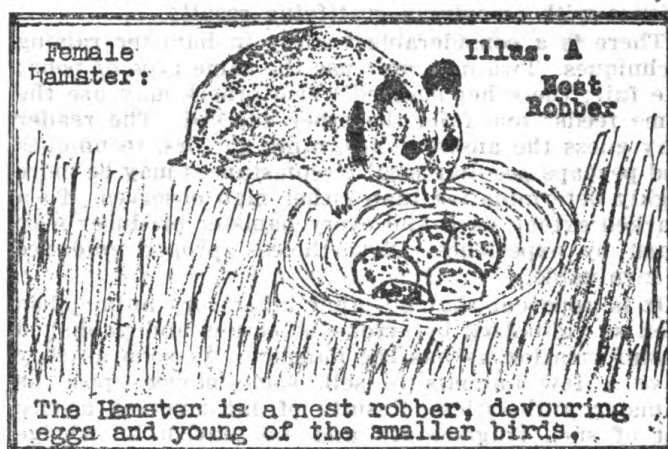
Hamsters are members of a mammal order Rodentia, and include three main groups inhabiting parts of Europe and Asia. The Dwarf Hamster, *Cricetulus*, approximately  $2\frac{1}{2}$  to 4 inches in total length; and the giant Common Hamster, *Cricetus*, approximately 8 to 11 inches in total length. Neither dwarf nor giant hamsters have found laboratory favor or pet popularity. The third, the *Mesocricetus* Hamsters, are of a size in between, have 12 to 16 functioning mammae (nipples), are more prolific than dwarf or giant which have but eight mammae. Wild *Mesocricetus* Hamsters, Golden, were captured in Syria, domesticated in Palestine, and some descendants later exported to England, the United States and elsewhere. From the Greek word *Mesos*, meaning middle or in between, and the Latin word *Auratus*, meaning golden, came the scientific name of the Syriac-Palestinian Hamster: "Golden Hamster, subgenus *Mesocricetus*, variety *Auratus*." An abbreviated designation, "*Cricetus Auratus*," is sometimes employed. Syrian Golden Hamster is the commonly used name.

In wild state, normal Golden Hamsters are 5 to  $6\frac{1}{2}$  inches long, weighing 3 to  $4\frac{1}{2}$  ounces in mature adulthood at 16 to 18 weeks of age. As might be expected, the favorable conditions and proper care in domestication have developed the hamster until good stock weighs 4 oz. upward, and 4 to  $5\frac{1}{2}$  oz. is standard weight for best breeders. Hamsters are beautifully furred a deep golden brown to deep golden red on back and sides, and white to pale bluish grey underneath the body. Distinct dark markings appear on ears, neck and skull. Notably large, elongated cheek pouches—inconspicuous while empty, enormous when filled—used for carrying food and nesting materials.

Eyes are glistening black, prominent and large. With stout body and short legs and tail, general appearance is coney-like. A truly beautiful animal.

### 3. Native Life

Wild hamsters inhabit waste and pasture lands, and grain fields. Being fond of grains, they prefer locations among thickets and rock slides and beneath stone fences near growing or stored grains. The animals burrow  $1\frac{1}{2}$  to 6 feet to nest, where they store



huge amounts of grains or other foods. They like to eat in or near their nests. Omnivorous in diet, they eat almost anything. Most common enemies of hamsters are foxes, hawks, owls, polecats, snakes and weasels. While the earliest breezes of summer are moving in, the first unweaned litter of kittens roams the burrow. Immediately outside the hole the alert mother may be watching or playfully cuffing her offspring, frequently sitting up to listen, to sense any possible danger to her romping kittens. In that wild

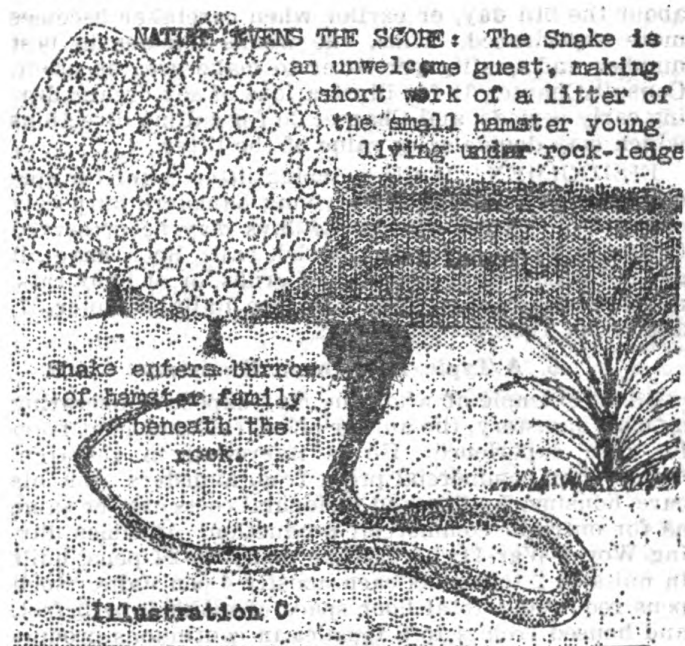


state, if food or water become scarce while the mother is still nursing her litter they may suckle her to the point of desperation. Temporarily she may then become highly carnivorous, raiding the nests of birds, mice and other small creatures to furnish the protein and moisture content food for her young and herself. Under prolonged desperation in failure to procure sufficient other nourishment for them, the mother may resort to cannibalism, killing one of the kittens, likely

a daughter, then joining the litter mates in devouring the flesh. Under such situation the litter count may be reduced regularly to balance the food supply. A domesticated hamster mother may behave similarly with her young if starved to the point of such desperation.

#### 4. Living Multiplication Tables

Far more prolific than cavy, mink or rabbits, up to 18 young, weighing approximately  $\frac{1}{14}$  to  $\frac{1}{8}$  oz. each, are born per litter. Females are old enough sexually to mate at 35 to 40 days, and may give birth to first litters at about 8 to 9 weeks. Gestation (pregnancy) is a period of less than 16 days (averages 15 days,  $21\frac{1}{2}$  hrs.), during which time the female may gain from 1 to  $2\frac{1}{2}$  oz. and may double her girth during the last 9 days of that period. Governed by food and water supply, weather and other hazards, the wild litter, averaging 5 to 10, is weaned at 21 to 28 days and weighs from  $\frac{5}{8}$  to  $1\frac{3}{4}$  oz. per animal, according to circumstances of extreme favor or disfavor encountered during the unweaned life of the litter. Eyes are not fully opened until the 15th day. Unless the mother drives them away earlier, the kittens do little foraging before the 22nd to 24th days.



The 10 days following weaning are days of rapid development of instinct and amazing growth of body but of highest casualty in the wild state. Those surviving learn much about hawks, owls, snakes and four-footed foes. Hamsters are actively inquisitive, which frequently favors destruction by beasts of prey. The young females are about ready for first matings, and in all probabilities spring females may become grandmothers before snowfall. In native state, according to warmth of climate, reproduction generally is limited to 6 or 8 warmer months of the year. Life span is about  $2\frac{1}{2}$  years.

#### 5. Domestication

Hamsters are comparatively new to domestication, having only about 19 years of history under the care of man. They have remarkable freedom from any native disease, are clean, not noisy, have no smelly

body odor, have high adaptability in both domestication and laboratory usefulness. They flourish in higher temperatures than tolerated by most strains of laboratory mice, rats, caviae or rabbits, and readily adapt themselves to sudden drops in temperature. Thus, by nature, the hamster has many advantages as servant of both education and science.

Natural tameness, inquisitiveness and adaptability make them delightful animals to propagate and use. Hamster fondness for attention attracts adults and children alike to watch the climbing, nesting and pen habits of these interesting creatures. Year around breeding normally occurs in domestication. Size of adults may be greatly modified by care and feeding. Likewise may care, feeding, pens and certain scientific practices exert important controls over date of weaning, as well as number, size, sex and quality of weaned young per litter. A profitable litter at 21 days may weigh 2 to 3 times as much as its mother. The importance of these considerations may not be over-emphasized, and these are treated in detail in Parts IV and VIII. For instance, when a maximum number of well-developed females per litter are desired, either for sale, laboratory or one's own future breeders, some of the baby males may be removed from the litter about the 6th day, or earlier when caretaker becomes more experienced. Thus, one weans females in best number and quality per litter to make greater profit. Consult Chapter 31 for illustrations of sex organs during early periods, and Chapter 30 for culling directions which may double sales value of the litter.

**FISHERMEN!** While reducing litter count for specific purposes as suggested, young hamsters purposely culled from litters at 3 to 12 days may be preserved frozen or in brine for future fish bait. Such have all game fish bait attractiveness of grubs, or of baby rats, mice or opossums of same age. See Baits, Chapter 37, and Other Uses in Chapter 38.

#### **6. A Typical Basement Hamstery**

As an example of what one may expect in operating a small hamstery, the author offers this comment from his own experience. He is interested in research, rather than commercial profit from hamsters. But his care, housing, feeding and incidental costs are the same as for outright commercial production. At times during World War II, he used as many as 24 pens, built in units of 2 to 4 pens each, mostly 4-pen units. Such pens required a total floor space of about 2 by 3 feet, and housed from 4 to 8 females in continuous production—together with the breeding males, unweaned and weaned young, plus additional laboratory stock shipped in for such war-time research—frequently a total of 100 to 160 animals in his own basement. These never furnished enough noise or odor to be detected even faintly up in the house itself. Every pen had self-cleaning area in floor, such as shown in Chapters 19, 22 and 23. A hobby basis producer not engaged in research would not need as many pens on the basis of only 6 or less hamsters in production. Most of the work with them was done after 9:30 p. m., with the exception of time required showing them to guests in the same field of interest, and in the conducting of certain experiments in connection with such visits. Little time is required for their care. The quiet, un-offensive nature of these creatures is much to their advantage as pets, hobby subjects, money makers, and, most important, as laboratory animals.

## II

### HOW TO START A HAMSTERY, EITHER HOBBY OR COMMERCIAL

#### 7. Preliminary Steps

Certain mistakes may be avoided by informing oneself. The novice might well read through this entire book, then reread parts or all, before making any decision as to type or number of pens or amount of breeding stock desired for starting the hamstery. It is so much easier to read than to rebuild. Intelligent investigation and reading now may save both disappointment and loss of time as well as money. Valid information used with good sense assures success in commercial phases, as well as in hobby phases, of the venture.

After a careful reading of this book, the interested person may ask himself the following: Do I like small animals? Have I suitable quarters for hamster pens? Can I afford a few dollars in a hobby, although it may fail to bring any financial returns whatsoever? There will be such investment in pens, breeding stock, feed, and possible advertising, if you wish to sell outside your local community.

Please note that the author does not sell hamsters. Therefore, these pages are not loaded with sales bait to hook a large breeding stock order. Herein are some facts, sort of words to the wise, usually omitted from high-powered sales literature.

#### 8. A Profitable Hobby

With increasing interest on the part of educational institutions and growing acquaintance with this comparatively new animal by the laboratories, the hamster's productiveness assures a good profit for a highly pleasant home hobby at a low investment in space for housing (basement usually being satisfactory), breeding stock, pens and feeding. Little time is required for their care. Hamsters do not require fancy or expensive housing. Pens are easily and simply made at home by the average person at all interested in pets and small stock. Few hobbies rival hamster interest to youth, professional people, naturalists, pet producers, sportsmen, small stock fanciers and home makers in general.

#### 9. Pen Construction

The type of pens used in any hamstery is left to the owner's own choice. It should be noted that there should be twice as many pens as producing females in a hobby hamstery so as to properly house breeding males, weaned young, etc. In proportion to production, commercial hamsteries usually have larger and fewer pens for housing weaned young. Production pens built as in Chapter 23, described as author's preference pens, may be found to be most economical and durable as well as easiest to use . . . lasting for years. Consult Illus. 2 to see how orderly they appear and how little space they require. Pens should be built before breeding stock is purchased.

#### 10. Buying Commercial Breeding Stock

On no other point does the beginner with hamsters more urgently need advance information than on buying his first breeding stock. Hamsters are primarily

laboratory animals, and as such may be listed by either gram or ounce weight. 28.3495 grams weight 1 oz. avoirdupois. All reliable breeding stock selections are quoted on age-weight basis, weight in ounces. Mature adult weights are attained by 16 to 18 weeks of age and are shown in ( ) as follows:

Sub-standard breeding stock (3, to almost 4, oz.) generally produces satisfactorily for cage pets, elementary schools, parks, zoos, sportsmen (for animal and fish baits), experimental breeding and limited laboratory usage, and usually sells below standard stock prices.

Standard breeding stock (4 oz. upward), acceptable for all standard laboratory production as well as uses previously mentioned, is highly recommended to the average beginner planning to sell both laboratory animals and breeding stock.

Superior (premium), to highly superior, breeding stock ( $4\frac{1}{2}$  oz. upward), is recommended for production of highest grades of commercial breeding stock and laboratory animals. Suitable for all hamster uses.

Selected for future breeders, females from 4 to  $5\frac{1}{2}$  oz. standard stock should at 4 to 5 weeks weigh 2 to  $2\frac{1}{2}$  oz., often more. The buyer of such females has the advantage of observing their growth until mating time. Mated at 8 to 10 weeks, they should make first quality mothers. A fine male,  $4\frac{1}{2}$  oz. upward when purchased, may repay his cost in the extra quality of the first litter from his service. A good male does not need



BREEDING MALE—FEMALE CONTRAST

painting or branding to identify his sex at a distance of several feet. Sex is readily observed, as shown in Illus. 1. The male is distinguished by his elongated rear section. Female squares off bluntly at the hips, as shown by the F and arrow pointing to the dash line showing how female hip and rear section appear in contrast when placed upon picture of male for comparison.

Buy breeding stock from a shipper who guarantees age and weight, and who also guarantees shipment of virgin females regardless of age. Otherwise, you may pay for females whose best production is already past.

**WARNING:** A few commercial shippers price breeding stock with record of production pedigree at about 2 to 3 times what same quality of stock may cost from most reputable persons selling standard to superior stock. Experienced small stock raisers are not suckers for such bait.

Buy your breeding stock from a hamstery where honesty counts. Two or three pairs or trios, or two sets, is a good start for a beginner. A set consists of 1 male and 3 females. Some shippers offer a lower

price per animal when larger numbers are purchased. For that reason, a beginner who knows where he may immediately sell some of the stock to be shipped to him may safely order more animals than he may need for starting his own hamstery. Regardless of strain names used, two or more hamsteries near each other frequently pool production to fill orders, and may exchange stock to add new blood.

### 11. Hamster Strains, So-Called

The hamster in American domestication and laboratory use is the Syrian Golden Hamster. For advertising purposes, various attractive names are employed to interest breeding stock and pet buyers. The author and other competent small stock judges have examined thousands of hamsters, including both breeders and offspring, from all lines of production and report no one dealer's so-called strain or strains in any manner superior to others of like condition and weight from any well-managed hamstery. Whether prize, gem, royal, wonder, gold mine, diamond, or what have you strain, buy them of whatever or no strain name, as you please, cross them as you like. They are of one variety, *Mesocricetus Auratus*. The important consideration is the quality of stock selected to fill your order.

### 12. Breeding Records

Breeding records such as kept on rabbits, etc., are simple and inexpensive, and are kept in a well-managed hamstery. Upon a pedigree and breeding record card (see Illus. 54 and 55) is written the date of birth, and name, number, letter or symbol representing a female. Upon a similar card is written similar data on a male. Then follow data on parents, grand and great-grand parents, if desired. Below, or on the reverse side as per Illus. 55, are the blank spaces for keeping accurate record of matings, litters, etc. Such a record is useful in maintaining or improving quality in production. With animals sold for breeding stock, some shippers include such breeding record cards, writing thereon two or three generations of ancestors, which are equivalent to unregistered pedigrees—some others charge about 10c extra per animal for such records—showing the beginner how to keep breeding and production records, for he uses the card to keep a breeding record of the animal named thereon. See Chap. 32 for illustration of such card and how to keep records. In filling a breeding stock order, unless otherwise requested, an honest shipper selects males not immediately related to each other or to females shipped; females likewise. Thus, pedigrees on commercial breeding stock purchases are unnecessary.

### 13. Pet Fanciers and Small Stock Farmers

It appears that the largest profit and most pleasure in proportion to time and money invested comes to small operators keeping only a few producing animals, selling offspring for purposes bringing largest returns per animal, such as pets and observation propagation stock for nearby schools, as well as for breeding stock sold to others locally and in surrounding territory at the regular prices for them while these animals are still so new. Buyers frequently pay more for stock they may see and take right home with them. The

odorless, quiet nature, and brief gestation period mark the hamster as the ideal school propagation animal.

#### **14. The Beginner and the Laboratory Markets**

Remember that the large, highly commercialized hamsteries are out to get all of the larger laboratory orders they can handle. Competition for large orders is keen. During the first 3 to 6 months one should take it easy, study the animals and their possibilities, learn advertising rates in all publications he might wish to use later, contact local doctors, visit laboratory technicians in nearby hospitals to offer a few hamsters (young stock, possibly free of charge for first experiments) for technicians to try out to learn hamster possibilities, sell a few animals for pets, get cages or pens into schools (see folder, School Hamsters), sell enough breeding stock to pay all expenses, but not breed more than necessary to supply the foregoing outlets. The hamster industry is no place for even the most experienced producer of any other small stock to start in on a big scale. Those who start out buying a large number of breeders are more likely than not to find themselves in sorrow. Six is about the maximum number of females advised for the beginner. In many cases, 2 or 3 may be enough. Why? These animals are PROLIFIC! Hamsters are perhaps easier to raise than most other small stock, but they are absolutely different and unique, and to attempt to raise them on the same schedule and with the same equipment as mink, cavies, rats, rabbits, etc., is to invite disappointment. It takes a few weeks to learn first-hand the fascinating characteristics making the hamster so unique and so valuable. After 2 or 3 months, if your hamstery output is selling right along and you like the animals well enough to warrant expansion, you might place some classified advertising where it will do the most good (Chap. 56), contact other nearby hamsteries about the matter of helping fill orders which may come too soon or too large for you. Average laboratory orders are too large for a lone beginner. But this may still be too early to expand production. When sales demand expansion, exchange young stock with these other hamsteries to add new blood and raise most of the choice females desired for any added production pens.

One with experience raising other laboratory animals, also having proper connections for laboratory sales, may, like any other beginner, start with 6 or less production females. Then, after a couple of months' careful study and handling of hamsters, he may expand to any number desired to meet his laboratory markets.

#### **15. Purchase of Newly Weaned Female Hamsters**

As suggested in Chap. 10, whether beginning or expanding a hamstery, either hobby or commercial, there is real advantage in buying carefully selected females at 4 to 5 weeks. Not only do they usually cost somewhat less, but one may watch their development until proper age for best first matings. Some dishonest shippers have sent older runts when young females were called for in an order. To the novice, a 14- to 15-week runt may at first appear to be a normal 5- or 6-week female. So, it may pay the buyer to be reasonably certain of the integrity of the source of his breeding stock. Laboratories expect good weights, and the better stock produces a better weight average of good young throughout the productive

lifetime of hamsters in both sexes. If possible, it is well to buy one's first breeding stock from a producer in one's own community. This permits the novice to ask questions first hand, see actual operation of a hamstery, and see the animals selected for his own start with hamsters. In buying mail-order, beware of lists that fail to give and guarantee the age and weight of stock, and that fail to guarantee females to be virgins.

One starting a hamstery and planning to begin production at once had best go in person to a hamstery and buy females 8 to 12 weeks old, virginity and exact age guaranteed; and males 15 to 20 weeks; all stock weighed individually in buyer's presence. One may safely buy such stock mail-order from only such shippers as are known to be absolutely honest. Several crooked outfits have shipped heavy weight but worn out stock to fill such orders for beginners. Know your shipper!

#### **16. Expanding Into a Commercial Hamstery**

When one places more than 8 females in production he has started into commercial hamster raising, and must take into serious consideration all of the essential factors given in this book. Good judgment is of untold value in guiding one through all details of the business. A commercial hamstery is a business institution. After 3 to 6 months introductory stage, some experienced small stockmen with adequate laboratory connections may expand to about 25 producing females. For others, it may appear best to expand to only 8 or 12, for this second stage, while learning more about the business angles of such an industry. Of course, many who start through hobby interest will prefer to keep about the initial number of breeders, say 4 to 8 adult animals, and have all of the fun and profit afforded by such a small space hobby. In any case, wait until your confidence in both yourself and the animals is well established before you build pens for the future. Let your family and friends enjoy with you the pleasantries of the project and all of you will get a lot of fun out of the capers, antics and strange ways of these fascinating little creatures.

The most successful large commercial hamster raisers average to have the animals about a year before they decide to develop into large scale production with 50, 100, or several hundred breeders. It is hoped that this fact may be of guidance to the reader.

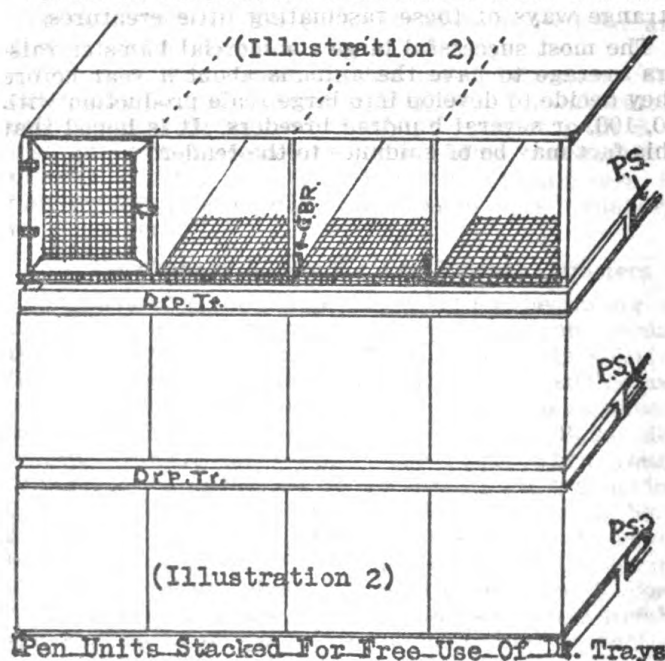
### III HOUSING

#### 17. Introductory Notes

Low cost and small space production make hamsters popular with the small stock fancy and pet raisers. Living quarters should be adapted to the hamster's nature and to durability in service. Therefore, housing unit details favoring satisfactory production and long usefulness are desired. However, a simple low cost but properly constructed home-made pen is all that is needed for the friendly hamster's home in domestication. Beware the over-simple, too cheaply built all solid floor pens made to sell and replace. Pens should be built with the idea of using them for years. However, do not be discouraged if the first pens do not look professional. This is a home-hobby job. If widths of lumber do not work out just right, there is no harm in having the top extend an inch or so over the front or back, or both. BUT, be careful to saw ends of all boards squarely to avoid leaving wide cracks or uncovered openings to invite gnawing. Self-cleaning floor features are highly desirable as shown in most of the plans to follow. Hamsters need self-cleaning area in the floor for same reasons as do rabbits. Why don't rabbit raisers use solid floor hutches? The answer will be clear as we continue through the treatment of housing. We know of no users of laboratory animals within a radius of 175 miles who buy animals raised on solid floors, i.e., floors without self-cleaning features. As per current laboratory supply lists and advertisements, modern laboratory cages have wire floors with droppings trays underneath.

Hamsters stand a wide range of temperature, 55 degrees upward being favorable. Temperature in general is fully treated in Chap. 29. The animals do well in either light or somewhat darkened locations. Direct rays of hot sunshine should be avoided. A reasonable amount of fresh air is appreciated.

Detail in construction illustrations show the sim-

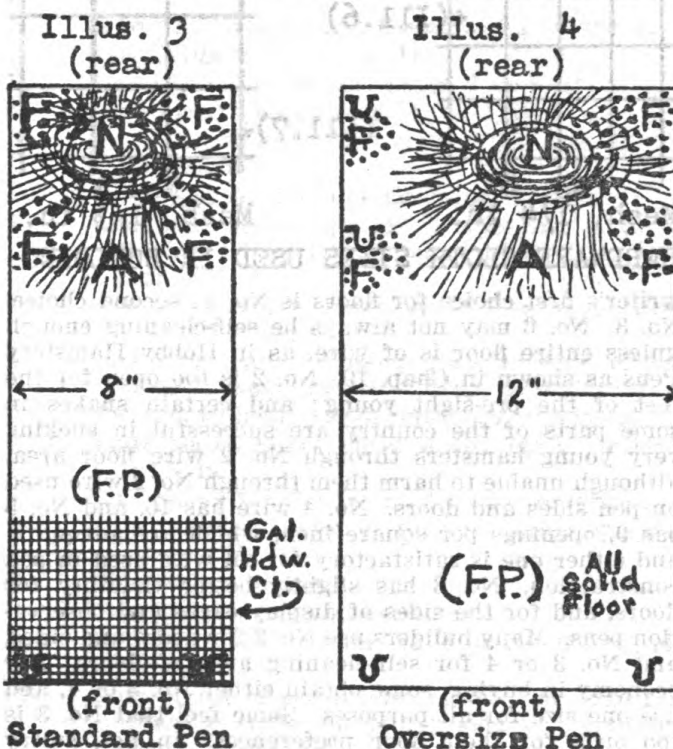


plicity of building these pens following the step-by-step directions set forth herein.

First, consider the great advantages of using dropping trays. 99 per cent of pen odors may be due to unsanitary conditions such as stale urine and the vaporous residue of same. Pens with self-cleaning area feature in floors require only a little longer to build, but save hours of cleaning time. Urination through the self-cleaning area into the droppings tray saves this offensive odor and prevents needless contamination of food. Hamsters like clean pens, so much of the excreta and other waste particles pass into the droppings trays. Trays may be emptied each week or 10 days without disturbing food stores or nests, and favor a pleasant, profitable situation. Laboratories and producers alike are rapidly turning to such self-cleaning advantages. No technician likes to handle animals carrying filth and foul odors; neither are such welcome about the home. Avoid both by proper construction of the pens. Illus. 2 shows a stack of such pen units with self-cleaning floor features, pen supports (P. S.) permitting free use of droppings trays (Drp. Tr.).

#### 18. Pen Habits

Illus. 3 and 4 give details of hamster pen habits. Pens of approximately 7½- to 9-inch widths simulate native quarters, food stores, etc., and are called stand-



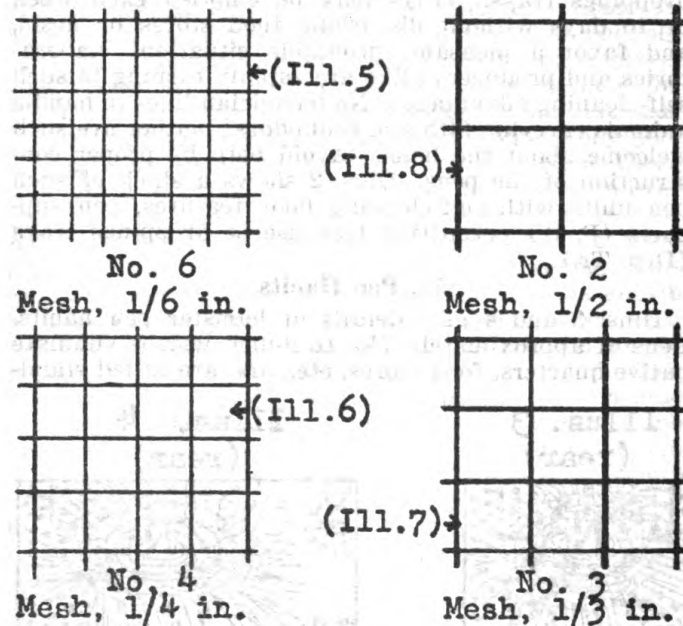
#### ILLUSTRATIONS OF HAMSTERS' PEN HABITS

ard pens. Pens of 10- to 12-inch widths are oversize and permit must waste of materials, foods, etc. F.P. shows where the caretaker places food. F,F,F,F show where the hamster stores the food. The sloping apron of nesting materials (A) leads up to the nest (N). Caretaker drops nesting materials at F.P. Excelsior, straw or grass may be used. Excelsior is preferred, and the animals make their own nests. Instinctively, the nests are usually made about the same size. In

standard pens, Illus. 3, food stores (F) are in and on the slopes of the nest where the young may readily get to them, and urination (U,U) is in the front corners, passing at once into the trays. As in Illus. 4, oversize pens allow extra floor width inviting urination near some of the food stores (U,F).

### Hardware Cloth

Hamsteries use galvanized hardware cloth, otherwise called hail screen, in sizes No. 6 to No. 2. Illus. 5 shows No. 6, 36 openings to the square inch. Illus. 8 shows No. 2, 4 openings to the square inch. The



### HARDWARE CLOTH SIZES USED IN BUILDING

writer's first choice for floors is No. 4; second choice, No. 3. No. 6 may not always be self-cleaning enough unless entire floor is of wire, as in Hobby Hamstery Pens as shown in Chap. 19. No. 2 is too open for the feet of the pre-sight young; and certain snakes in some parts of the country are successful in sucking very young hamsters through No. 2 wire floor area, although unable to harm them through No. 2 wire used on pen sides and doors. No. 4 wire has 16, and No. 3 has 9, openings per square inch, which are adequate, and either one is satisfactory for all wire used in pen construction. No. 3 has slightly better visibility for doors, and for the sides of display cages and observation pens. Many builders use No. 2 for doors and sides, and No. 3 or 4 for self-cleaning area of floors. For economy in buying, some obtain either No. 3 or 4, and use one size for all purposes. Some feel that No. 3 is too open for their floor preferences. In hot, sultry weather, hamsters like to stretch out and rest on the hardware cloth. For that and other reasons, the oldest and largest American mass production hamstery at low altitude, near the Atlantic coast, has for years used 8 (wide) by 10 by 21-inch pens constructed of one-inch boards, except for doors and entire floors which are of No. 6 hdw. cl. for ventilation and self-cleaning advantages. Considering needs peculiar to all sections of the country, floors of part wire and part wood, as in Chapters 22 and 23, are generally satisfactory to caretakers and favor highest productivity of hamsters.

## 19. Hobby Hamstery Pens

Simple stack-locking, gnaw-proofing, and self-cleaning features make these pens unusually popular with hobbyists, home laboratory and research workers, sportsmen, and other small producers. Pens are so light that even a frail person may easily handle them. Hobby Hamstery Pens are not observation pens or display cages, but breeding pens designed for high productivity. Wire doors provide sufficient vision for study of the animals and their habits. Each pen is standard size, 8x10x21 inches inside.

In all construction, it should be remembered that so-called 2-inch boards may be only 1½-inch thickness, and 1-inch boards ¾- to 7⁄8-inch thickness, depending upon grade of lumber. A board selling as a 6-inch width may actually be 5½ inches. So, a so-called 10-inch height inside a pen may be ¾ less than 10 inches. This fact is mentioned so that the builder will make doors to fit doorways after the rest of the pen is completed. Doors required may be slightly wider, but less tall, than otherwise might be expected. Saw boards to lengths shown in list of materials, and other details will work out nicely.

### HOBBY PEN BUILDING MATERIALS

Dimensions are given in inches.

**Key:**

- E,P Three 1x10x22 boards, 2 ends and 1 partition.
  - Bk One 1x10x19 back (Fig. II).
  - DS One 1½x1x19 door sill (Figs. I and III).
  - N Two 1x8x13 nest boards (Fig. III).
  - S Four 1x4x15 stack-lock strips. Use 3 in. if preferred.
  - DF One 1½x1x72 for making 2 door frames.
  - BS Four base strips, approx. ¾ wide and ¼ to ½ thick, 19 long for stripping hdw. cl. to bottom (Fig. V).
  - TP One top 1x23x19, made up of 2 or more 1-in. boards 19 long.
  - Tr One home-made droppings tray, 18 wide, either 12 or 23 long, and 1 to 2 deep, as preferred.
  - GB Two guard boards 2x8, approx. ½ thickness.
  - GBR Four pieces heavy sheet metal (galv. or tin) 1x1¾ in.
  - DC Two pieces 11x13 hdw. cl. for door coverings.
  - V Two 5x5 pieces hdw. cl. for ventilation opening covers (Fig. II).
  - H Four 1-inch hinges.
  - Ho Two small hooks and eye-screws.
  - Flr. One 19x24 piece either No. 4 or No. 6 hdw. cl. for floor.
  - CS Four strips of scrap hdw. cl. 3x10 or 4x10 for climbing strips on either side of partition, shown in Fig. III.
- Small quantities of 1- to 2-in. nails; small pkg. of small finishing nails or 1-in. wire brads; small pkg. of No. 5 double pointed tacks.

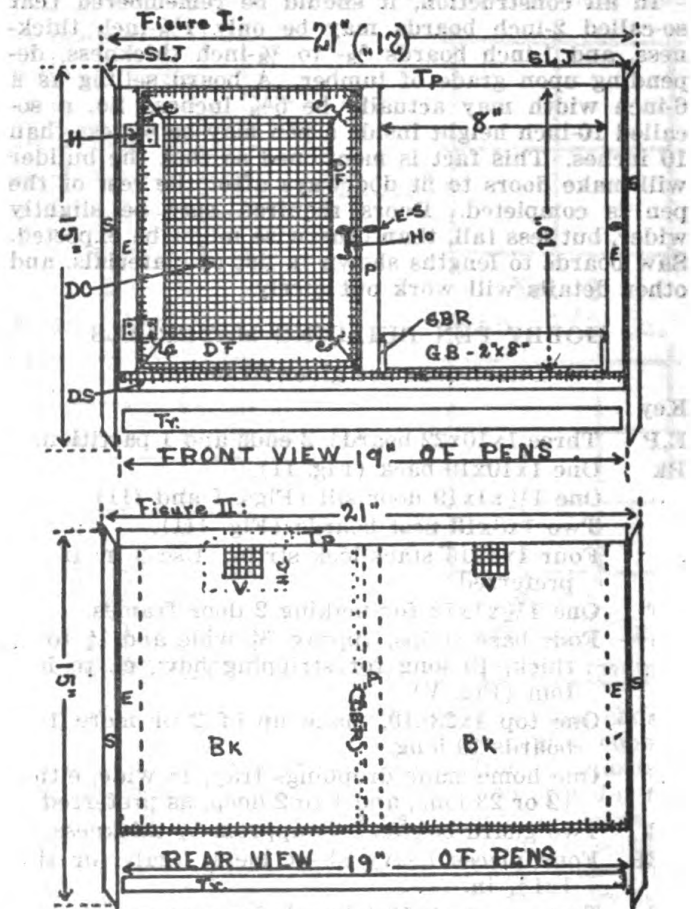
Lumber or board materials used need not be new, but should be hard wood and reasonably sound, especially for partition board (P). Saw ends of boards squarely to avoid cracks in corners. If corner cracks do occur, they may be covered by wood strips approx. 1 in. squared nailed into corners as corner posts (c.p.

or ccs in Illus. 27, Chap. 23), same length as inside height of pen.

Illustrations herein are not drawn to scale, but approximate such accuracy as to safely guide. Measurements given are accurate, both as to materials used and dimensions marked in all figures and illustrations.

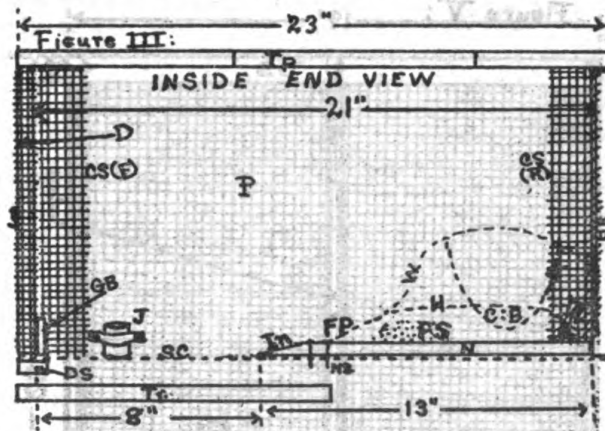
#### STEP-BY-STEP INSTRUCTIONS

Read carefully. General building techniques apply to all hamster pens. Saw the back board (Bk) 19 long. Saw two ventilation openings (V, Fig. II). Install hdw. cl. to cover openings (V) from inside, shown

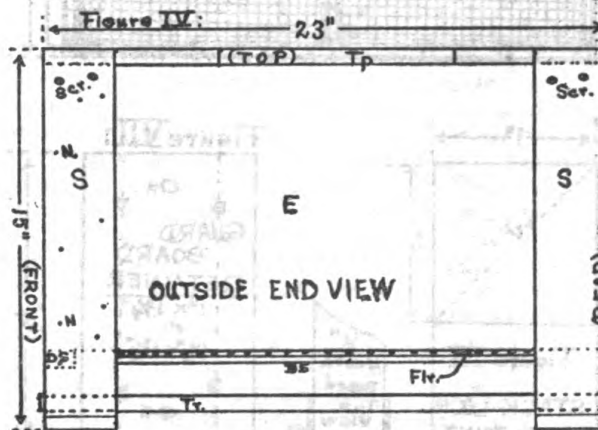


by shadow line of dots (HC) in Fig. II, with hdw. cl. extending over top of opening at least 1 inch, to be bent in toward front of pen to tack to underneath side of pen top (Tp) after top has been fully installed. Now draw pencil lines down middle of back to guide in placing partition (P) exactly in middle of this 2-pen unit. Nail back (Bk) to partition (P), then attach the end boards (E). Saw out top boards (Tp) 19 long to run crosswise of the pens. Top boards may overlap back board (Bk) without inconvenience. Nail first top board in place so that front edges of top (Tp), partition (P) and ends (E) are even and make both pens of even width. Install remaining top boards. Now turn the 2-pen unit top-side-down and tack loose ends of ventilation cover strips (V) to inside of top board. If desired, climbing strips CS(R) may be tacked in rear corners, approx. 1 inch to back board and remaining 2 or 3 inches of their width to the partition (P). Corner posts may be installed outside CS(R); or

if corner posts have already been installed, CS(R) may be tacked over same, or immediately forward from same. These fully gnaw-proof the corners. Similar climbers, CS(F), may be tacked so as to be just inside the closed door. Next, install hdw. cl. floor. It

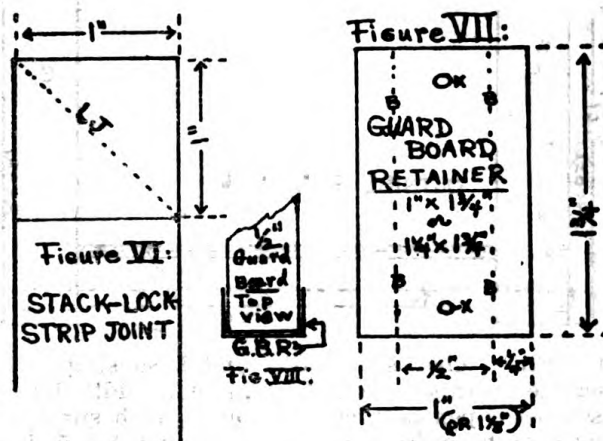
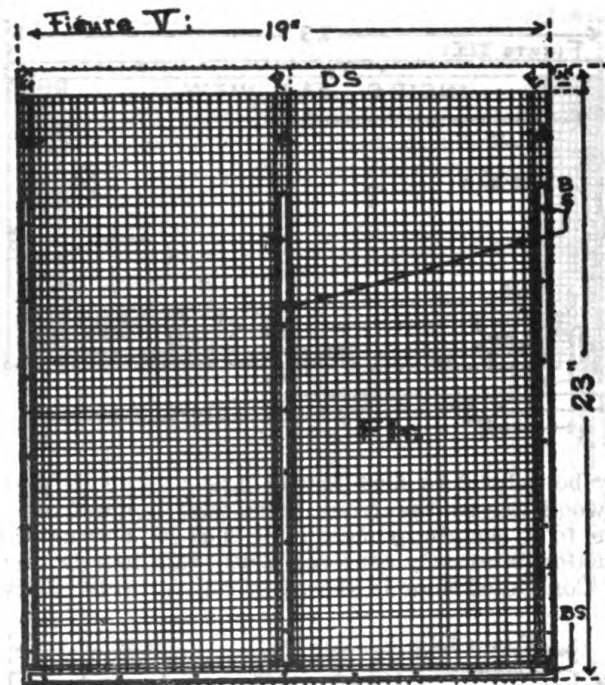


may be helpful to first lightly nail a temporary strip of wood across the front ends, just down from the edge, to be certain by measuring that the bottom of the partition is exactly centered while the floor is tacked on. Completed floor is shown in Fig. V. Hdw. cl. wire



floor (Flr.); door sill (DS); and base strips (BS). Assemble in this order: Lay 24 inch width hdw. cl. crosswise of pen bottoms, so that  $\frac{1}{2}$  inch surplus extends over both front and back. Using No. 5 double pointed tacks, secure hdw. cl. firmly across one end (E), then pull tightly and tack across the other end. Now tack hdw. cl. to partition. Nail door sill (DS) in place on pen bottoms so that it matches the front edges of ends and partition, and covers  $1\frac{1}{2}$  inches of the flooring as shown in Fig. V. Now turn surplus  $\frac{1}{2}$ -inch hdw. cl. at front down over front of door sill (DS) and tack securely to DS front edge. Bend rear surplus  $\frac{1}{2}$ -inch hdw. cl. to tack to rear, outside of back. Base strips (BS) are optional, but recommended to prevent sagging of wire floor after long usage. Strips of ripped lath or old wooden box  $\frac{1}{2}$ - to  $\frac{3}{4}$ -inch wide and  $\frac{1}{4}$ - to  $\frac{1}{2}$ -inch thick do well for this purpose when nailed on with any small 1- to  $1\frac{1}{4}$ -inch nails, box nails preferred. To illustrate how base strips are installed after flooring is in place, Fig. V shows base strips extending only about  $\frac{4}{5}$  of the distance, U showing

unfinished portions. Strips may extend across bottom of back board and forward to door sill (DS). Entire flooring is now complete. Extensive detail has been given for clearness of directions. Actual work is exceedingly simple and easy.



**DOOR CONSTRUCTION:** Door frame is made of material  $1 \times 1\frac{1}{2}$ , used flat for 1-inch thickness of doors. Corners of the frame are joined as per Fig. I. Small finishing nails are suitable for corner joints, but small corrugated fasteners (C) across door frame joints may be used for reinforcement. Frame should have about  $\frac{1}{4}$ -inch clearance on all 4 sides when tried in doorway before hdw. cl. covering is installed, since in this door design the hdw. cl. is to pass around the edges of the door. In mounting hinges, if a small drill is at hand, it is well to drill holes for screws to avoid splitting out the screw holes in door frames, etc. **OPTIONAL:** Door construction same as in pen designs in Chaps. 22 and 23 may be used if desired. In these pens, doors fit doorways closely, and hdw. cl. does not come around door edges.

**NEST BOARDS:** Nest boards (N) in Fig III, approximately 1x8x13 board, should be of sufficient width to fit snugly against the sides of pens. Nest board front end is sawed off to a 2-inch taper to provide incline (In) permitting pre-sight young to return freely to the nest. Two nails, 1½-inch length (NS), one a short distance behind the other, should be driven through nest board before installed to reach through hdw. cl. and prevent board sliding forward except when caretaker removes same for complete cleaning of pen. Nest board gives mother hamster a sense of security and prevents small food particles falling from food stores by the nest. Different lengths of nest boards may be used. This length provides about 8 inches of self-cleaning floor. Some producers use No. 6 hdw. cl. floors without nest boards.

**WATER:** J in Fig. III shows a small watering jar, such as face cream jar, approximately 1½ high and 1- to 1½-in. wide. Larger jars may be used for adults only. A strip of tin keeps the jar always in same location. The bottle and tube waterer shown in Chap. 24 is preferred by many.

**GUARD BOARD:** Years ago, the author devised the guard board shown as GB in Figs. I and III, and appearing in other pen plans herein. It serves several purposes. Young are absolutely prevented falling out the door when caretaker opens it. During moments of restlessness, adult hamsters gnaw at this uncovered board, since they instinctively treat it as their chief obstacle at the closed door. Such gnawing furnishes endless employment and usually distracts them from gnawing elsewhere, and their teeth are properly exercised for maintenance of healthful dental condition. Guard boards are about 2x8 and ¾ to ½ thick. Any wooden box material is satisfactory. Hamsters gnaw the board down sufficiently for replacement every few weeks, which is a sign that they are sufficiently exercising their teeth. This small thin board is held in place immediately inside the door by means of retainers GBR in Figs. I, VII and VIII; or simply by means of thin-headed nails or staples as shown in Illus. 31, Chap. 23. To make the GBR, use a piece of heavy sheet metal (galv. or tin) 1x1¾, or 1½x1¾, which may be bent with sufficient ease. As in Fig. VII, drill or punch 2 holes (x) for use of screws or short nails. Bend metal along lines B so that guard board retainer fits well over the end of ½-inch board as in Fig. VIII. Now install GBR immediately inside doors, so that when doors close each door butts up against the guard board in its doorway. Fig. I shows right pen without door to illustrate G.B. sliding down into place.

As per Fig. III, hamsters build nests cup-shaped in warm weather (dash line H) and ball-shaped in extreme cold temperature (dash line W). Nests cover 9 to 11 inches on rear of pen floor. C:B represents the cup or bottom of nest.

Caretaker may place vegetable trimmings and cubes of animal food upon the wire, grains and other small foods may be placed on nest board near edge of nesting material (FP) to prevent loss through self-cleaning area of floor. Hamsters then usually store food in areas marked FS and in corners back of the nest.

**DROPPINGS TRAYS:** One tray extends under both pens of the unit. Tray may be 1 or 2 inches deep, as desired; and either 12 long as in Fig. III, or 23 long as in Fig. IV. Light weight wood material, such as

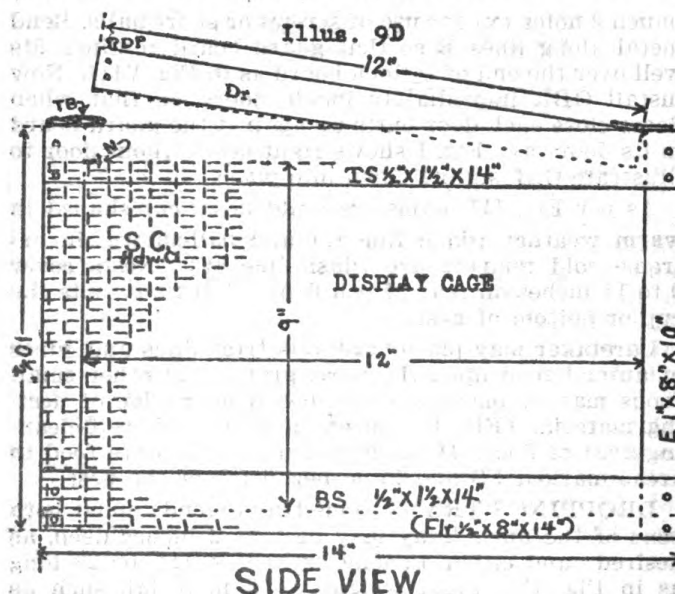
wooden box, does nicely; or one may use any sheet metal. It is well to lay old newspaper in bottom of tray, and to place in front corners of tray just a small amount of absorbent substance such as sawdust, earth, peat moss, shavings, ashes, etc., to absorb urine and thus prevent odors. If trays are emptied about once per week or 10 days the hamstery keeps in a practically odorless condition.

**STACK-LOCK STRIPS:** Should the builder wish, floors for this pen may be made just like those in Fancier's 2-Pen Unit, Chap. 22, with front part hdw. cl. and rear part board, in which case the quickly installed Pen Supports (PS) of plain 2x4 blocks may be used instead of Stack-Lock Strips shown as S in Fig. IV in this pen design.

For those desiring to use this pen exactly as designed, here are the stack-lock strip directions: Either 3- or 4-inch board width may be used, 4-inch giving better service. Fig. VI shows how to saw off ends of board to make stack-lock joints on the ends of these strips which are also the supporting legs for the pens. Saw on the dotted line LJ. The receiving joint is an inch deep. The Fig. I two-pen unit lowered to rest upon that in Fig. II shows exactly how stack-lock side strips join to lock the entire stack of pens and prevent any sidewise sliding or falling of pens. The 2-pen unit is turned upon its side to install the stack-lock strips, as S in Fig. IV shows them already in place. Tops of strips are even with tops of pens. Fasten with 2- to 2½-inch nails, clinching for added strength. If desired, two 2-inch screws (Scr) may be placed immediately below the stack-lock joint to afford more ruggedness. Holes may be drilled for such screws. Fig. IV also shows hdw. cl. floor, and base strips (BS) supporting the floor. If desired, pens of this design may be built in 3-pen and 4-pen units by using top and back boards 9 inches longer per additional pen desired per unit.

## 20. Display Cages

Illustration 9D shows a display cage suitable for exhibiting hamsters at pet shows and fairs, also for school room pets. This pen may be constructed double-length, with partition, to display two pens of animals.



Or, may be built 21 inches long inside to provide ample observation propagation space. Specifications given hereafter are for a cage 14 long, 10½ high, 9 wide, outside measure; 12x9x8 inside, door closed.

#### DISPLAY CAGE BUILDING MATERIALS

Dimensions are given in inches.

Key:

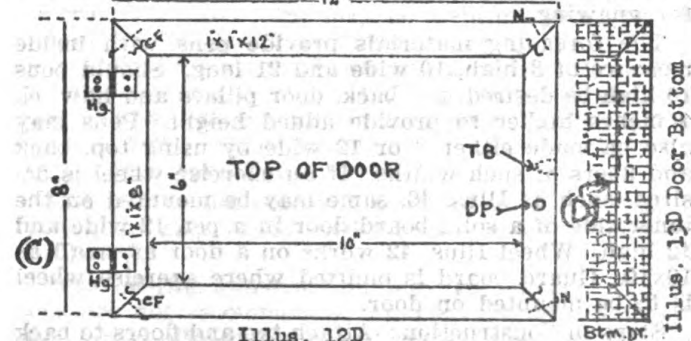
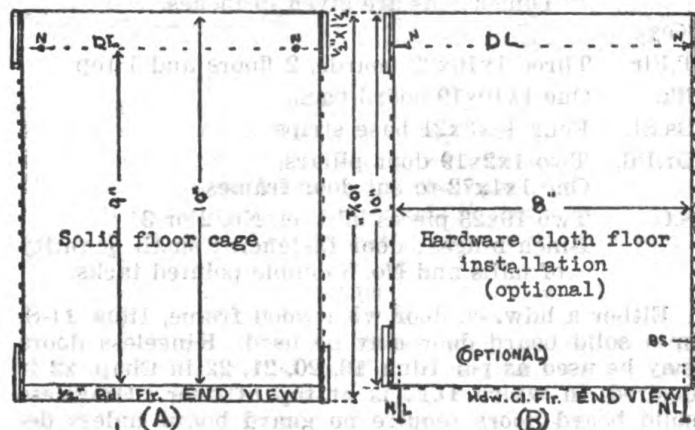
- E Two 1x8x10 board ends.
- TS Two ½x1½x14 top strips.
- BS Two ½x1½x14 base strips.
- Two 1x1x12 door frame.
- Two 1x1x8 door frame.
- One 8x12 hdw. cl. door cover.
- SC Two 9½x14 side covers, No. 2 or No. 3 hdw. cl.
- A One ½x8x14 board floor.

Two 1-inch hinges; one turn button; small quantity of nails and No. 5 double pointed tacks.

**CONSTRUCTION:** First, nail the board floor to the board ends. Nail a temporary strip of wood across top of cage to hold tops of the ends in place. Turn on one side and install hdw. cl. side covering. As per Illus. 9D, hdw. cl. reaches from bottom up to within one inch of top. Nail on the base strip (BS), then the top strip (TS), as in Illus. 9D. Turn cage over and install the other side covering and strips. When installed, the door level (DL in Illus. 10D) upon closing reaches the top of the hdw. cl. sides. One inch below top, or at this DL line two nails (N) should be driven to prevent closed door sagging down into pen. Door frame should have as little clearance as possible for easy lifting. Door construction is as shown in Illus. 12D. Small corrugated fasteners (CF), or thin nails

Illus. 10D

Illus. 11D



Illus. 13D Door Bottom

(N), or both, may be used at corner joints. Using No. 5 double pointed tacks, hdw. cl. is installed on bottom of door, running to all edges but not covering edges of door. Bottom of door is shown in Illus. 13D-D. A door knob or pull (DP) of any sort desired, even an extending nail or screw, may be used to lift door. Turn button (TB) or other convenient fastener is used to prevent animals nosing the door open.

**Optional Features:** Hdw. cl. floor for self-cleaning advantages may be used instead of board floor (A). See (B), Illus. 11D, wherein a 10x14 floor piece of No. 6 or No. 4 hdw. cl. covers bottom, laps up one inch between each hdw. cl. side and base strip (BS). In that case, thin nails (NL) may be driven into each corner and left extending downward an inch or more, to serve as legs to support the cage above a pan, droppings tray, or newspaper spread for same purpose. In arranging this feature, the base strips are installed after hdw. cl. floor is installed. Or, one 14x28 continuous piece of No. 4 or No. 6 hdw. cl. may be used down one side, across bottom and up the other side.

If desired, hdw. cl. sides may reach to top of cage, in which case each hdw. cl. side piece is  $10\frac{1}{2}\times 14$ . Or, if of one continuous piece, 14x28. Optional: Top strip material 1 inch square may be used instead of  $\frac{1}{2}\times 1\frac{1}{2}$ , for greater vision, if desired.

A display cage constructed on this plan, with or without optional features, should afford long and satisfactory service.

## 21. Two-Pen Solid Floor Observation Unit

The following solid floor 2-pen unit is easily built and gives a clear view of all pen activities of the hamsters so housed. Construction is the same on both sides.

### CONSTRUCTION MATERIALS

Dimensions are given in inches.

Key:

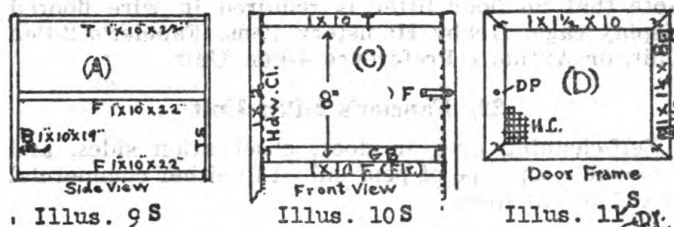
- T,Flr. Three 1x10x22 boards, 2 floors and 1 top.
- Bk. One 1x10x19 board back.
- Bs.St. Four  $\frac{1}{2}\times 3\times 21$  base strips.
- Dr.Pil. Two 1x2x19 door pillars.  
One 1x1x72 to cut door frames.
- S.C. Two 19x23 pieces hdw. cl. No. 2 or 3.  
1-inch hinges; door fasteners; small quantity of nails and No. 5 double pointed tacks.

Either a hdw. cl. door with wood frame, Illus. 11-S, or a solid board door may be used. Hingeless doors may be used as per Illus. 16, 20, 21, 22 in Chap. 22 if desired, in which D.F. is at top of door. Hingeless solid board doors require no guard board unless desired, provided small sticks of wood are placed in pen for gnawing.

The foregoing materials provide pens with inside measure of 8 high, 10 wide and 21 long. Should pens 10 high be desired, use back, door pillars and hdw. cl. 4 inches higher to provide added height. Pens may also be made either 8 or 12 wide by using top, back and floors of such widths. If an exercise wheel is desired, such as Illus. 46, same may be mounted on the inner side of a solid board door in a pen 12 wide and 12 high. Wheel Illus. 42 works on a door as small as 10x10. Guard board is omitted where exercise wheel is to be mounted on door.

**Steps in Construction:** Attach top and floors to back

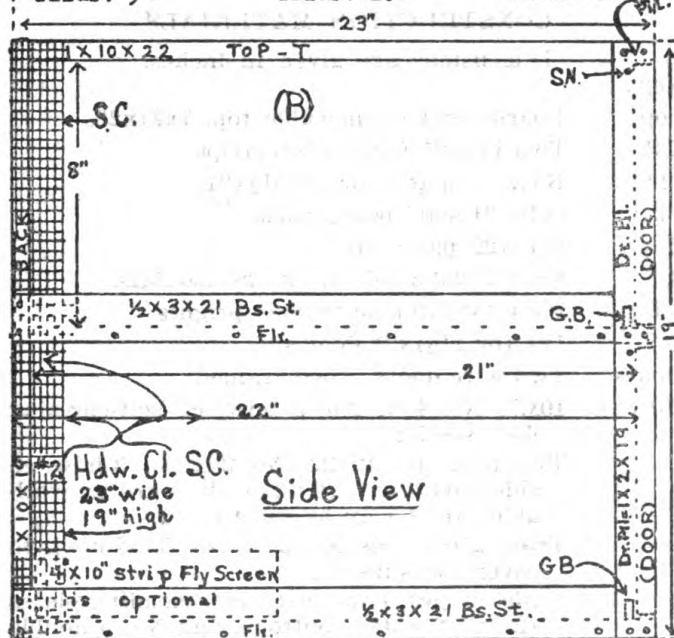
as in Illus. 9S. Lightly nail a temporary strip (TS) up and down front of pen to hold proper position during building. Turn on side and install hdw. cl., tacking to sides of back as well as to top and floors as shown.



Illus. 9S

Illus. 10S

Illus. 11S



Illus. 12S TWO-PEN SOLID FLOOR OBSERVATION UNIT

Hdw. cl. 23 inches wide permits same to reach to front edges of board floors and top, where it may be left to be a part of the doorway. (Or, front edge of hdw. cl. may be turned back, lapped over, to make a double thickness against the inside of the closed door, shown by dotted line, reached by arrows in lower pen, Illus. 12S.) Next, nail door pillars (Dr.Pil.) in place. Remove TS. Then, tack front ends of hdw. cl. to door pillars. Nail the base strips in position as shown in Illus. 12S. If No. 2 hdw. cl. has been used for sides, and if food particles are stored high enough to fall out the sides, a 4x10 strip of fly screen may be dropped down between the hdw. cl. side and the base strip (Bs.St.) which will prevent any such waste of food. Illus. 10S shows front view of top pen. 2x10 guard boards (GB, Illus. 12S) may be installed as shown in Figs. I, VI, VII and VIII, Chap. 19; or by use of 2 or 3 thin nails or staples shown in Illus. 31. Illus. 11S shows door construction. A 2-inch mending plate is found to be a highly satisfactory door fastener (D.F. in Illus. 10S). All doors should fit as closely as may permit free operation.

At any time desired, part or all of hdw. cl. sides of these pens may be covered on outside with glass or cardboard.

Pens of this construction may be stacked. These pens are not recommended for heavy production, but the plan is offered for use of those who may wish to

experiment with all solid floor pens which should be cleaned each week or 10 days. A floor litter of about 1½ inches of shavings, sawdust, peat moss, or other absorbent material is advised in pens of this type. Note that no floor litter is required in wire floored display cage, Hobby Hamstery Pens, Fancier's 2-Pen Unit, or Author's Preference 4-Pen Unit.

## 22. Fancier's 2-Pen Unit

Self-cleaning area in floor, observation sides, and removable top type of pens suited to either commercial or exhibition stock.

### CONSTRUCTION MATERIALS

Dimensions are given in inches.

**Key:**

- Top        Boards make removable top, 1x21x23.
- T.S.      Two 1x1x21 (or 20) top strips.
- Flr.      Boards make floor 1x15½x21.
- Bk.       1x10x21 solid board back.
- P         1x10x22 partition.
- S.F.      Four 1x2x22 side frame horizontals.
- S.F.      Four 1x2x10 side frame uprights.
- D.S.      1x1 (or 1½)x21 door sill.
- Doors     Two wire doors, wood framed.
- Hdw.cl. 10x21 No. 4 or No. 3 hdw. cl. self-cleaning floor section.  
Two 10x21 (or 10x22) No. 2 or No. 3 hdw. cl. side coverings. If other sizes are unavailable, No. 4 may be substituted.  
Two 9x10 pieces No. 2 or No. 3 hdw. cl. to cover doors inside.  
Nails, hinges, joint fasteners, mending plates (2 in.) for door buttons, and No. 5 double pointed tacks.

If desired, solid board may be substituted for one or both observation type sides, still retaining the self-cleaning area in the floors. Observation sides are especially suited to continued and intimate study of all pen habits of both adults and growing young. Most hamsteries will desire at least one fancier's unit for advantageous display of stock to guests.

### STEPS IN CONSTRUCTION

Review building instructions given in Chap. 19 for general guidance.

First, attach partition board (P) to middle of back (Bk). Next, construct the pen side frames as shown in Illus. 13 and 15. Both corrugated fasteners (or joint fasteners, J.F.) and thin finishing nails may be used at frame corners. The 1x2x6 pillar (Pil.) set in the frame is sawed to a length to fit snugly, yet not spring the frame apart. This pillar gives extra strength where pen supports (P.S.) rest the forward weight of other pens in the same stack, and are held in place by use of 4-inch mending plates on either inner or outer side of frame. Now, install hdw. cl. side covering to inner side of side frame (S.F.). A 10x21 piece of hdw. cl. will run forward to a point just inside the door (Illus. 15, top); or a 10x22 piece will run forward to front of frame (N in Illus. 15, lower part); or the 10x22 piece may be turned back, lapped over, to be double thickness just inside the door, as suggested

The drawings illustrate a two-pen unit with the following specifications:

- Plan View (illus. 13):** Shows a rectangular unit with overall dimensions of 21' x 10'. It includes a top section (1' x 2' x 2 1/2' S.F.), a side section (1' x 2' x 2 1/2' S.F.), and a front section (1' x 1 1/2' x 2 1/2' S.F.). The unit is divided into two pens by a vertical partition (P.I.). The left pen contains a wire door (WB) and a hardware (Hdw. Cl.) unit. The right pen contains a hardware (Hdw. Cl.) unit and a front section (F.C.). The unit is labeled "PS. B. illus. 13" and "P.S.C. 214".
- Side View (illus. 14):** Shows the side profile of the unit, with a height of 10' and a width of 21'. It includes a top section (1' x 2' x 2 1/2' S.F.) and a side section (1' x 1 1/2' x 2 1/2' S.F.). The unit is labeled "illus. 14" and "FANCIER'S TWO-PEN UNIT".
- Front View (illus. 15):** Shows the front profile of the unit, with a height of 10' and a width of 21'. It includes a top section (1' x 2' x 2 1/2' S.F.) and a front section (1' x 1 1/2' x 2 1/2' S.F.). The unit is labeled "illus. 15" and "FANCIER'S TWO-PEN UNIT".

—29—

partition as in Illus. 20. The top strips are short at both ends to allow for the pen's back and door. If a cross-tie (C.T.) is used as in Illus. 17, 18, 26, 31, 40, top strips are cut short enough to clear same when pen top is lowered into place.

A removable top furnishes unusual advantages in that the pen may be thoroughly inspected and repaired if necessary without tearing it apart. But with a removable top, some satisfactory means must be employed to hold the tops of ends (sides) and partitions in their proper place for doorways. One way is the drop nail (DN) shown in Illus. 13, 14, 20. The other is the cross-tie, a permanent strip built into the pens, which is the author's preference. Both are completely described.

**Drop Nail:** A small hole is drilled down through the top into each end (side) and partition, and a nail is dropped into each hole. An 8d common nail ( $2\frac{1}{2} \times \frac{1}{8}$ ) or a  $1\frac{3}{4}$ -inch roofing nail require a  $3/16$  drill hole. A  $5/32$  drill hole takes an 8d box nail. An 8d nail may be cut to 2 inches length and serve its purpose as well.

**Cross-Tie:** A  $1 \times 2 \times 19$  (plus) board is installed as per Illus. 17, 18. Partition is sawed barely enough to permit cross-tie to fit into its top edge as in Illus. 40, and back from front no more than required for closing of the doors. Ends of the cross-tie are secured at same position inside front ends of sides, as per Illus. 19, the side frames not being sawed, but nailed or screwed, Illus. 18. One of the best ways of securing this joint is by use of an inside corner angle iron plate (Illus. 19), cheaply obtainable from any variety or hardware store. Install same with screws into both cross-tie and sides. Care must be exercised to cut cross-tie of such length that the tops and bottoms of door openings will be of the same widths. If one uses solid board sides for these pens, both partition and sides (ends) are sawed out the same as in Illus. 40, and the cross-tie is nailed into the sides same as into partition. Two reasons why the cross-tie is preferred over the drop nail: First, when the pen top is lifted off, the strength of the pen unit is not lessened, since the cross-tie gives sidewise support to the entire front. Second, the front edge of the cross-tie makes an ideal stop for the top of the door, which stop keeps adult animals from rattling the doors.

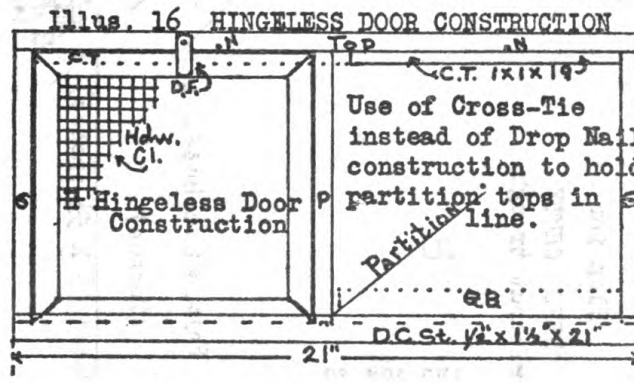
**Doors:** As per Illus. 14, wire doors are constructed of No. 2, 3 or 4 hdw. cl. installed on inner side of frames made of  $1 \times 1\frac{1}{2} \times 9$  and  $1 \times 1\frac{1}{2} \times 10$  wood. Frame corners are joined by use of small finishing nails or corrugated fasteners, or by use of both. Hdw. cl. may be cut long and folded under at edges to be double against door frame as in Illus. 33 for added strength. Small hinges are used to install doors. A 2-inch mending plate makes a good door fastener (D.F.). Mending plates have holes drilled in each end. A screw through one hole, into wood partition or side, installs this door fastener. A nail may be driven part way into the door frame, such nail extending  $\frac{1}{2}$  to  $\frac{3}{4}$  inch to serve as a door pull (D.P.) and as a rest for the door fastener when door is closed. This type of door fastener does not rattle like the hook and eye-screw, and is more easily installed. If desired, another smaller nail may be driven in the partition or side about an inch below the D.F. screw, and near the edge, to keep the D.F. in a certain position while pen door is open. Since these pens have plenty of ventilation through hdw. cl.

sides, the doors may be made of solid board if desired, as per wood door illustrated in right of Illus. 14.

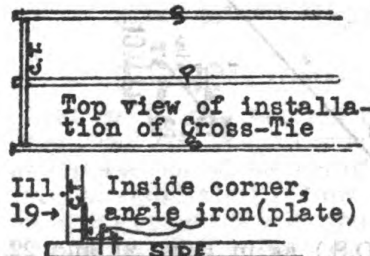
8x21-inch droppings tray (Dr.Tr. in Illus. 13) is made and used in the manner described in Chap. 19.

**PEN SUPPORTS:** The simplest means of stacking pens and pen units is the pen support (P.S.) shown in Illus. 13. Four such are required for each pen unit. Under each side, just back of the floor opening far enough to permit use of 8x21 droppings tray, install a wood block 2x2x4 inches (P.S.B.). Likewise, near the rear corners install similar wood blocks (P.S.C.). Since so-called 2x4 usually runs only about 1 $\frac{5}{8}$ , it may be advisable to add a  $\frac{1}{2}$ -inch strip to top or bottom of such P.S. to allow full 2 inches of support for all advantages of such distance between pen units. P.S. may be nailed to under side of floor or to outside of top.

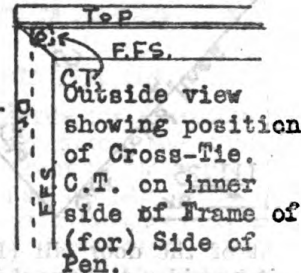
As per Illus. 13, a bottle and tube waterer may be used at position W.B. Detail of waterers are shown in Illus. 47, 48. And a feed chute of pattern given in Illus. 23 may be placed at F.C. as in Illus. 13. Since food placed in this type of chute falls to the floor, such chute must be used above the board portion of the floor to save food loss. To install this feed chute, see Illus. 24. Cut a piece of tin or galv. metal to 3 $\frac{1}{4}$ x5 $\frac{1}{4}$  inches. Fold sides along dash lines. Punch or drill two small wire holes (W.H.) to use wiring chute to side of pen. Cut one row of hdw. cl. just the width of the feed chute, and about 2 inches above the lower side frame. Insert the tongue of the feed chute through this opening. Before wiring the chute to the outside of the pen,



**Illus. 17**



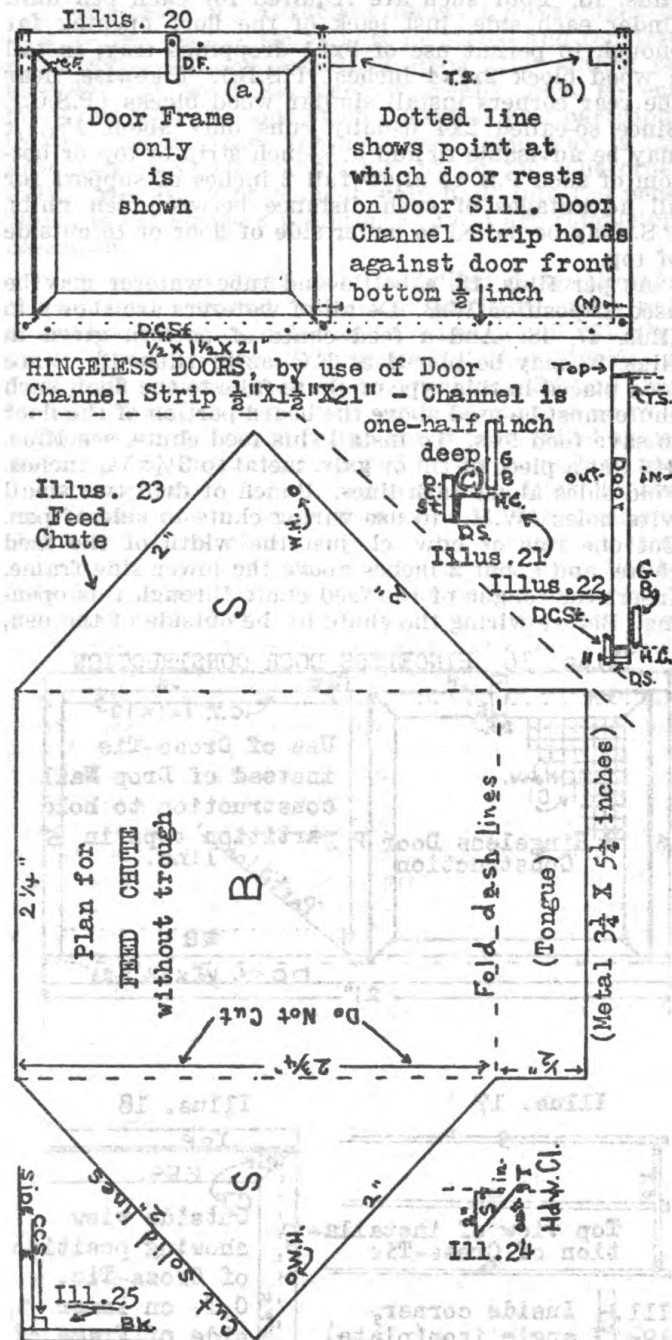
**Illus. 18**



bend the tongue down inside so that it hugs tightly against the hdw. cl. side of the pen, as in Illus. 24. The opening through the hdw. cl. should be  $\frac{3}{8}$  to  $\frac{1}{2}$  inch high. Less than  $\frac{3}{8}$  may not let food fall freely. Much more than  $\frac{1}{2}$  may permit animals to get their noses fast in the chute.

**Hingeless Door Construction:** Illus. 16 shows hinge-

less doors with cross-tie (C.T.) serving as door stop. Illus. 20 shows top strip (T.S.) serving as door stop, with the drop nail (DN) type of top construction. In hingeless door use, the door fastener (D.F.) is installed at the top, and a door channel strip (D.C.St.) is used at the bottom. Such a strip  $\frac{1}{2} \times 1\frac{1}{2} \times 21$  is nailed on the



front of the door sill (D.S.) as in Illus. 21 and 22. This provides a channel  $\frac{1}{2}$ -inch deep (C), in Illus. 21, for the door to rest in as in Illus. 22. The guard board (GB) prevents the bottom of door sliding into the pen. If guard board is not used, staples or nails may be driven into sides and partition about one inch above floor so that closed door may rest against the nails as (N) in right pen in Illus. 20. Hingeless doors may be either wire on wood frame, or all wood (one piece

board), as desired. The author prefers hinged front doors as standard equipment. A hingeless door may be of disadvantage while moving females in or out of the breeding male's pen.

Droppings tray is 8x21, about 1½ high.

### 23. Author's Preference 4-Pen Unit

Floor has self-cleaning area and removable top. Inspection doors in rear permit easy culling of litters, etc.

#### CONSTRUCTION MATERIALS

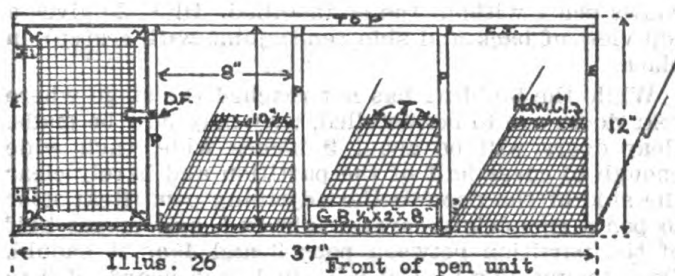
Dimensions are given in inches.

##### Key:

- Top Boards make removable top 1x23x37.
- T.S. Two 1x2x18 top strips, Illus. 32.
- Flr. Boards make floor 1x15½x37, Illus. 31.
- E & P Five 1x10x22 board ends and partitions.
- D.S. 1x1 (or 1½)x37 door sill, Illus. 21.
- Fr.Drs. Four front doors, wire with wood frames.
- Rr.Drs. Four hingeless solid board rear doors, Illus. 27.
- Hdw.cl. 10x37 No. 4 hdw. cl. (No. 3 is optional), self-cleaning floor section.
- C.T. 1x2x37 cross-tie, Illus. 31, 29, 30.
- B.T. 1x2x37 back-tie, Illus. 27.
- M.T. 1x1x37 middle-tie, Illus. 27.
- T.T. 1x1x37 top-tie, Illus. 27.
- Dr.Tr. 8x37 droppings tray, about 1½ inches high.

Nails, hinges, joint fasteners, mending plates (2-in.) for door buttons, No. 5 double pointed tacks, and 1x1 wood for optional miscellaneous uses.

Foregoing materials construct pen unit with front as in Illus. 26, back as in Illus. 27 and 28, top and floors as in Illus. 31. Optional plans for doorless back are given in Illus. 27a and 27b.

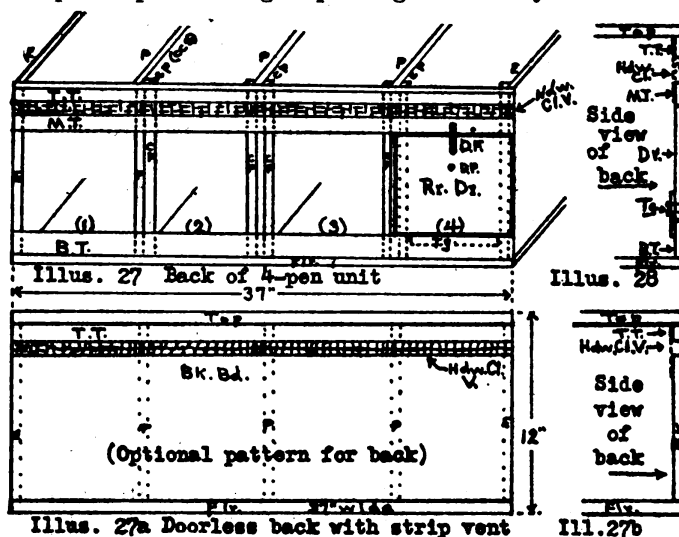


#### STEPS IN CONSTRUCTION

Set up the five 1x10x22 boards for partitions and ends. Nail two temporary strips across the front, one at top and one at bottom of front to make pen doorways of equal widths. Now, nail back-tie (B.T.) strip on back ends of the ends and partitions, as in Illus. 27. The top-tie (T.T.), hdw. cl. V. (ventilator), and middle-tie (M.T.) should be of such widths as to permit the use of a board rear door at least 5 inches high in each opening. So, one should determine the exact door height before installing the ventilation strip. Measure exact width of board you will saw up for rear doors. For instance, it may be 5½ inches. In which case, draw a line across the back exactly 5½ inches above the base-tie (B.T.). Next, cut a strip of hdw. cl. (No. 2

or 3 is preferable, but 4 or 6 is satisfactory) of a width to reach from about  $\frac{1}{4}$  inch above this drawn line up to the top, as shown in Illus. 28. Tack the hdw. cl. lightly in place. Ventilation opening  $\frac{3}{4}$  to 1 inch wide is adequate, and up to 2 inches is satisfactory. Now, nail the middle-tie and top-tie in place. Pen unit may be turned so that front end points into the air to tack hdw. cl. V. wire to inner side of these two strips of wood (M.T. and T.T.). Use No. 5 double pointed tacks.

Note in pens 2, 3 and 4, Illus. 27, cp(ccs) 1x1 inch corner posts, nailed in the corners to serve as door stops for the hingeless rear doors and as crack cover strips to prevent light passing too freely about the

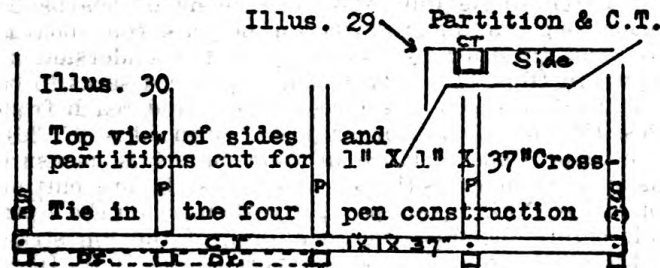


doors. An open crack may invite gnawing. So, the small strips serve well, and may be of any size from about  $\frac{3}{4}$  to  $1\frac{1}{2}$  inches square. These corner posts should reach from floor to top of pen, but not extend above so as to prevent top fitting closely. Illus. 27 shows pen 1 without the cp installed. Illus. 25 gives a top view of back and side (end) joint with ccs(cp) in place.

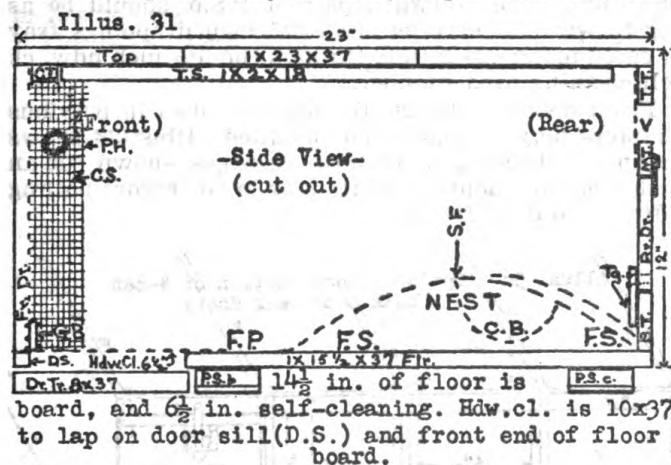
While the building has not reached the stage where rear doors are to be installed, they may now be made. Rear doors will be about 9 inches wide, each wide enough to cover half of the partition and barely clear the side of the door to the adjoining pen. Rear door to pen 4 completely covers right end, and covers half of the partition between pens 3 and 4 as it should. Door tongue (Tg.): Cut a  $\frac{1}{2}$  to 1 inch board, of 2 to 3 inch width, to the length that will fit snugly the pen width between both cp. To the wood door, as shown in Illus. 28 Tg., nail this tongue (Tg.) so that about one-half its width extends below the door. Hold the door flat, with tongue (Tg.) on top side, then slide tongue into door opening and lift top end of door upward to position shown in pen 4, Illus. 27. The tongue (Tg.) fits inside the back-tie (B.T.) as shown by Tg. dotted line. Illus. 34 shows a retaining channel for bottom of back door, instead of using door tongue as in Illus. 35, 27, 28. In either case, the strip serves as a crack cover (c.c.) for the joint (J) or door crack. A 2-inch mending plate held by a screw into the M.T. strip serves as door fastener, same as in Illus. 20. The door pull (D.P.), with which to open door, may be either staple or nail extending about  $\frac{1}{2}$  inch.

Install hdw. cl. section of floor, then install board section of floor, and door sill by same directions as given in Chap. 22 for Fancier's 2-Pen Unit. Illus. 31 gives side view showing complete floor, back and top construction.

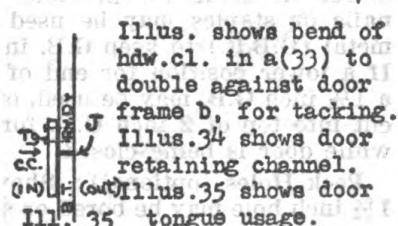
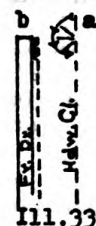
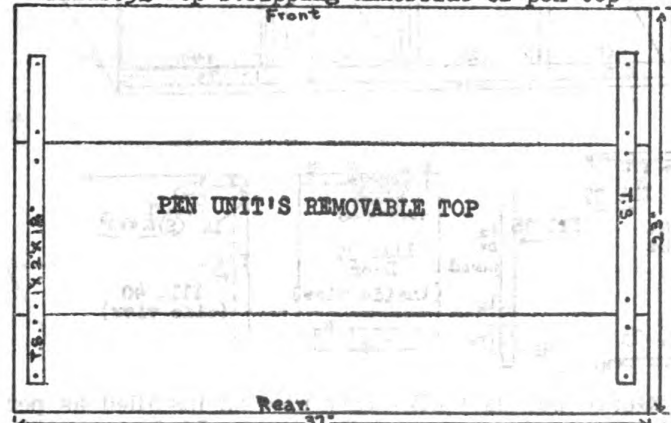
The cross-tie (C.T.) may now be installed as per Illus. 29, 30, 31, 40. Each end and partition is sawed



into, barely enough to permit C.T. to fit into its top edge, back from front no more than required for closing of doors. With ends and partitions equally spaced, nail cross-tie securely to them, as per Illus. 30, where



Illus. 32 Top-stripping underside of pen top



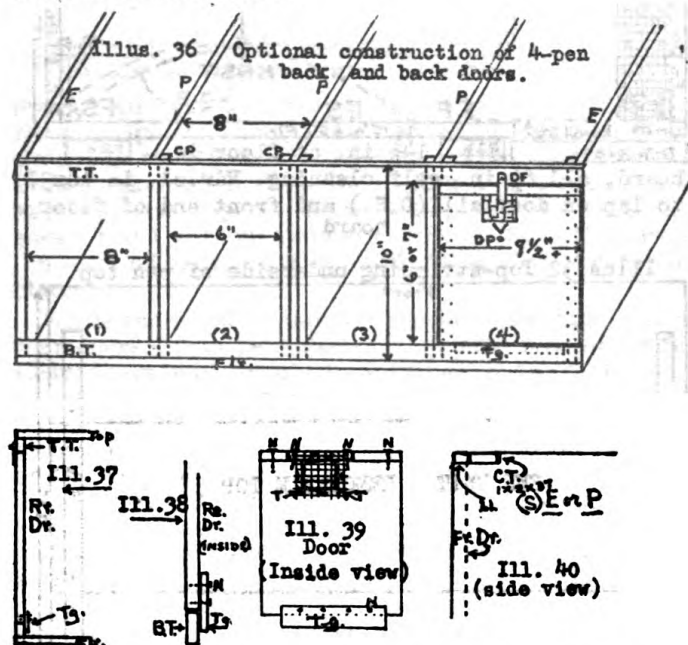
Illus. shows bend of hdw. cl. in a(33) to double against door frame b, for tacking. Illus. 34 shows door retaining channel. Illus. 35 shows door tongue usage.

dash lines show position of closed doors. 1x2 material is preferred, but 1 inch may be used as shown in Illus. 29.

Climbing strips (C.S.) in Illus. 31) are recommended 4x10 inches each, and may be used both front and rear, since the animals delight in climbing. Rear C.S. are to be installed before C.P. (CCS) are nailed in place.

The removable top 1x23x37 is made of boards 37 inches long running crosswise on the pens. Such boards are held together by top-stripping the underside as shown in Illus. 32. 1x2x18 board is placed so as to be just inside the pen side pieces (ends) and reach from cross-tie back to the corner posts (cp in Illus. 27, 36). Due to possible variance in your materials, measure distance from cross-tie to corner post before cutting top strips. Nail top strips lightly, then try on the 4-pen unit before the final secure nailing of the top strips to the top boards. The pen support blocks (P.S., Illus. 31) may be attached to either bottom of floor or top side of top. To avoid change to final position later, P.S. blocks may be tried in place and pencil marked for desired position before attaching them to the first pen units built. The forward pair of P.S.b. should be as far forward as may permit 8x37 inch droppings tray to catch materials falling through the 6½ inch hdw. cl. self-cleaning area of floor.

Front doors of design already described in previous chapters may be made and installed. Illus. 33 shows manner of bending down hdw. cl. edges, shown cut an inch long, to a doubled position as in "b" before nailing hdw. cl. to door frame.



Guard boards (G.B.) may now be installed as per directions given for previous pens. If desired, thin nails or staples may be used instead of bent sheet metal (G.B.R.) to keep G.B. in position; see Illus. 31. If a lower position for end of water tube is desired, a 1½ inch G.B. may be used, or a small notch may be cut into top of 2 inch G.B. for drinking tube to pass while door is being closed.

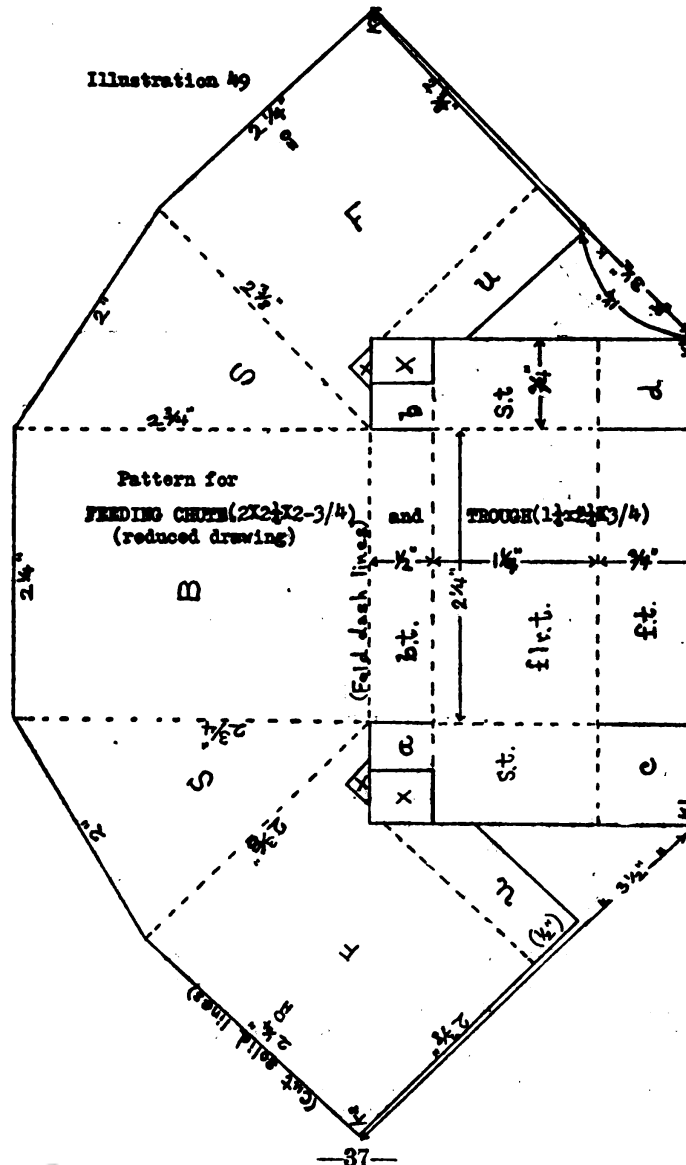
Peek Holes (optional): Shown as P.H., Illus. 31, a 1½ inch hole may be bored or sawed through partition

at least 3 inches down from top of pen, and in from the front far enough to be completely covered on each side by C.S. Animals like to watch each other on door and C.S. and get extra exercise by climbing up and down to do so. P.H. are not recommended near back of pen.

For those who do not wish to use rear inspection doors, optional back patterns are provided. Illus. 27a shows doorless back with vent strip. The lower part is solid board; then the ventilation strip and the top-tie (T.T.) strip. The hdw. cl. for the ventilation opening is installed so as to reach from top edge of top-tie down to at least 1 inch below top of back board (Bk. Bd.) as per Illus. 27b.

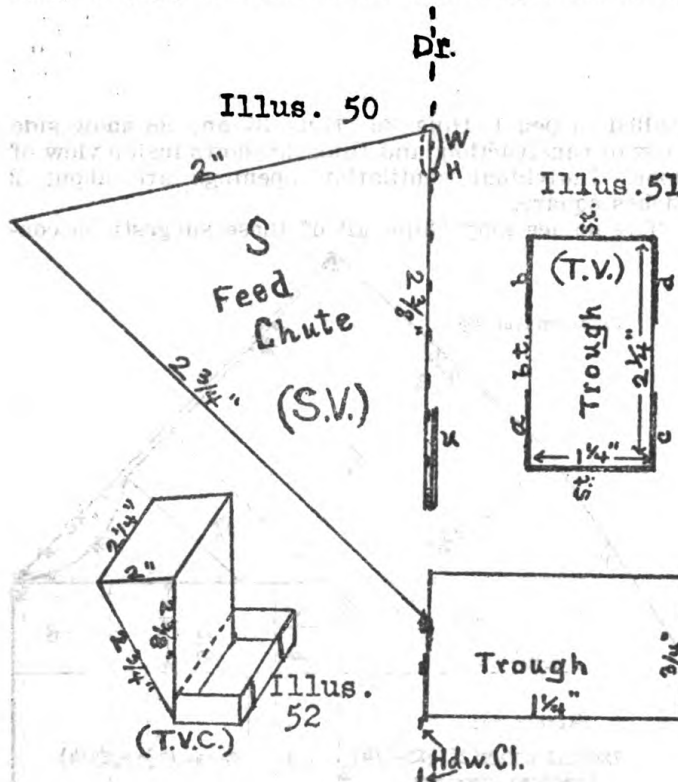
And, for any who may wish inspection back doors with individual ventilation openings, optional plan Illus. 36 shows construction of door, door tongue, corner posts and door fastener same as author's preferred pen choice Illus. 27. Corner posts are still to be installed in pen 1, Illus. 36. Illus. 37 and 38 show side view of construction, and Illus. 39 shows inside view of door. Individual ventilation openings are about 2 inches square.

The novice may think all of these suggestions con-



fusing. Restudy of all plans is suggested before any building is undertaken, since the builder may finally decide to build after one general plan but may include minor features he may prefer in another. That is why these optional features are carefully presented herein.

Again, a beginner may ask, "Is it worth going to the trouble of making pens with guard boards, corner posts, removable tops, and a lot of fangles and dangles?" Much of the small stripping materials used in such pens may be had as a gift from any mill or carpenter shop, since such scrap material has no value to them. Pens of the author's preference type have been in use for more than three years with no repairs except for replacement of some of the corner posts, and the tongues (Tg.) to some of the rear inspection doors.



Those doors may be worth their construction each time they are opened.

Pen habits shown in Illus. 31: Dash outline of nest. Cup or bowl of nest, C:B. Food stores, F.S.

Droppings tray, 8x37, may be used in the manner described in Chapter 20. If desired, one may simply add extra layers of newspaper instead of placing other absorbent substance in bottom of tray.

Feed Chute with Trough: The writer prefers to open each pen for each feeding, to place food somewhere on that front portion of the floor board shown as F.P. in plans. Such feeding cultivates acquaintance with the animals, makes them friendly, and keeps caretaker informed as to each pen's status. Therefore, he seldom uses feed chutes, except to experiment with feeding devices as such. The feed chute used in the front door of a pen with front floor area self-cleaning must be a chute with trough to prevent smaller food falling through self-cleaning area into droppings tray. Illus. 49 shows such a feed chute for the benefit of

those who desire to try it. A piece of tin or galv. metal is cut to  $8\frac{3}{4}$  long and  $5\frac{1}{4}$  wide at its widest part. It is then cut on all solid lines, and folded along all dash lines. Portions marked X are removed. Holes are punched or drilled at points shown (H). It is suggested that a first pattern be made of paper to learn the technique of cutting, folding, etc. Then, make one of metal for actual use. Illus. 50 shows feed chute in position on door, as per side view. Chute should be installed at such height that the top of the trough will be at least 3 inches above the pen floor, that animals may stand on hind feet and fill their cheek pouches instead of pawing the food onto the floor. With this in mind, an opening not more than  $2\frac{1}{4}$  inches wide, not more than  $\frac{1}{2}$  inch high, is cut into the hdw. cl. on the door. The feed chute has been assembled first, but the sides of the trough (s.t.) are merely folded upward and in enough to pass through the opening in the hdw. cl. Insert trough through door. Lower ends of trough fronting against door, shown as U, are then bent upward against inside of door as in Illus. 50. Trough front (f.t.) is bent to straighten-up position. Then, trough sides (s.t.) bend straight-up. Next, bend ends a, b, c and d around the corners as in top view, shown in Illus. 51. Wire (W) is run through holes (H) to secure top of chute to door's hdw. cl. front. In the pattern, Illus. 49, F is fronting the pen; S is side; B is back, away from pen door; in the trough, b.t. is back, s.t. is side, f.t. is front, and flr. is floor of the trough itself. The use of any feeding chute is optional. F.C., Illus. 47, shows position of chute on door. Illus. 52 gives a top and side view of a modified form of the same chute, the trough to slide through opening in hdw. cl. of door.

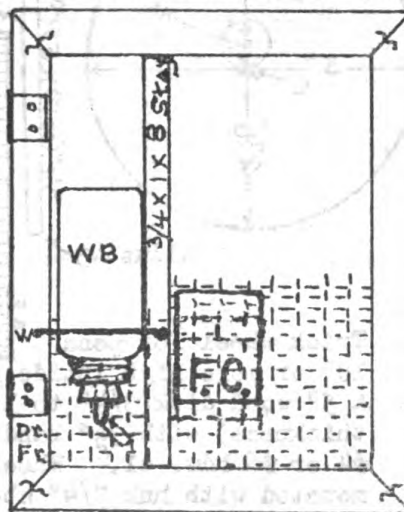
## 24. Watering Devices

Water should be available at all times.

If a small jar is used, a piece of No. 4 or 6 hdw. cl. may be inserted into the jar for a climbing strip. Young



Illus. 48



Illus. 47

### Bottle and Tube Waterer

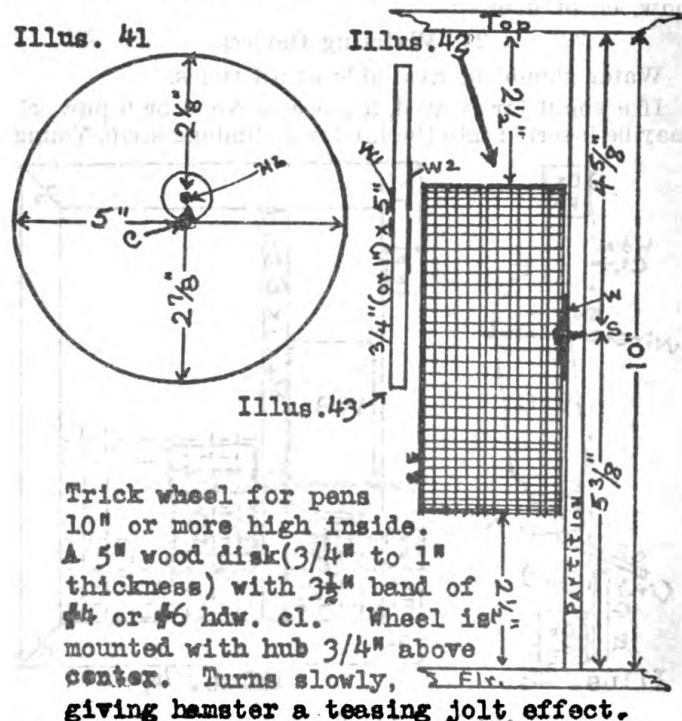
falling into the jar may thus climb out. Strip should fit tightly into jar and extend at an angle somewhat above the top of the jar. Such strip is not needed for adults or weaned young.

Many prefer the bottle and tube waterer. Any bottle with opening suitable for a drilled rubber stopper may

be used. However, a bottle that is too heavy may cause pen door to sag, also one that is too long may interfere with pen stacking. A square 4 oz. bottle, approximately  $1\frac{3}{4}$  in. square and 4 in. high, with 1 in. opening, takes a No. 6 drilled rubber stopper into which is inserted a  $3\frac{1}{4}$  to  $3\frac{1}{2}$  in. piece of  $\frac{5}{16}$  in. copper tubing bent to form an angle of approximately 120 degrees as shown in Illus. 48. Use of a bending tool is advised to prevent collapse of tube at the bend. The bottle hangs in a wire loop tied to the hdw. cl. of the door. Loop may be lifted to remove bottle for refill. Or, as in Illus. 47, a stay may be installed on door, into which stay and door frame is firmly attached a loose-fitting wire loop large enough for easy removal of bottle. Wire about the thickness of a 6d or 8d box nail is satisfactory. Such bottles and drilled rubber stoppers may be purchased from larger drug or laboratory supply stores, and copper tubing from hardware stores. Similar stoppers are available to fit pop bottles. Several small stock supply dealers offer assembled watering outfits suitable for hamsters. If the water level in a bottle does not appear to lower and show use of water by the animals in the pen, test the unit by touching lower end of tube 3 or 4 times. If your finger becomes wet each time by a new drop of water, the unit is functioning properly. Such a water unit provides a clean, constant supply of drinking water.

## 25. Exercise Wheels

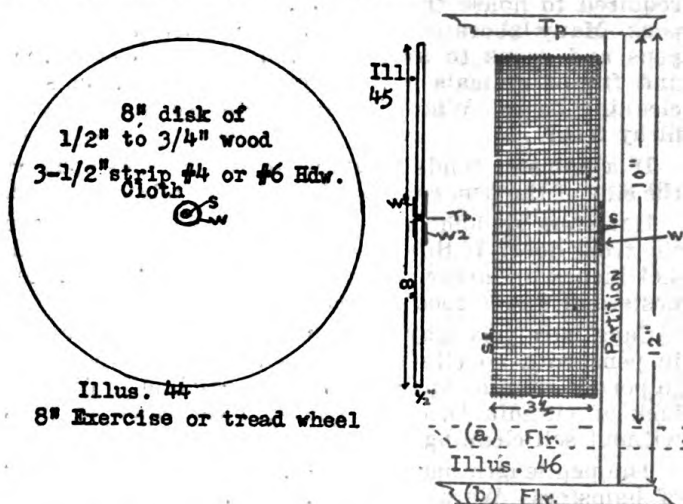
Since an exercise wheel mounted on the floor of a pen wastes breeding pen floor space and may be disastrous to pre-sight young, the only type of wheels



shown herein are those attached to pen side and mounted in an upright position. These wheels are cheaply and easily built of scrap materials, and do furnish exercise beneficial to both growing and mature hamsters.

Illus. 41 shows the 5 inch wood disk for a hamster

trick wheel. Wood disks may be sawed out by use of any band, coping or jig saw, and need not be perfectly round. The trick wheel is small, and the adult hamster gets his fun on the outside of the wheel, climbing up the side of the pen to mount the wheel; or climbing the outside of the wheel. A  $3\frac{1}{2}$  inch tread of No. 4 or No. 6 hdw. cl. is tacked to the edge of this 5 inch wood disk. Ends of hdw. cloth tread should overlap approximately  $\frac{1}{2}$  inch to permit smooth weaving in or tying of the wire ends. No sharp edges should protrude from the outer side of the hdw. cl. tread. Trim off the sharp points; or, better still, use the selva edge, which will strengthen the wheel. The hub (Hb) of this wheel is  $\frac{3}{4}$  inch above center (C), and wheel is mounted to the side or partition of pen by means of a screw or small bolt (S). Illus. 43 shows side view of wood disk with a large washer (W2) between disk and partition to permit more free action of wheel, and a somewhat smaller washer (W1) on the tread side of wheel to prevent head of screw or bolt cutting the wood. This wheel may be mounted so that its bottom is from  $1\frac{1}{4}$  to  $2\frac{1}{2}$  inches off the floor. Illus. 42 shows wheel mounted  $2\frac{1}{2}$  inches from floor. If  $1\frac{1}{2}$  inches off floor, young from the 16th day onward may benefit by climbing into and upon this wheel which uses less pen space than any other wheel. If free running of wheel is desired, simply make the hub (Hb) at center (C). If one desires a wheel taking even less pen space, the hdw. cl. tread stripping may be only  $2\frac{1}{2}$  inches wide. The screw or bolt mounting this trick wheel should be back about 7 inches from front end of partition to allow clearance of front climbing strip (CS) and easy servicing of the pen.



Of all hamster wheels, the author favors the 8 inch exercise or tread wheel shown in Illus. 44, 45 and 46. The hub is at center as in Illus. 44 so that the wheel turns freely. A small piece of metal tubing (Tb, Illus. 45) may make a better hub. Washers (W) are used same as in trick wheel mounting. Illus. 46 shows wheel mounted in pen, and (a) shows bottom clearance in pen 10 inches high as approximately  $1\frac{1}{4}$  inches. It is just as well to mount this wheel with  $1\frac{1}{2}$  inch floor clearance since animals use the inside of wheel and young may begin treading or turning it from the 16th day. If preferred, a hdw. cl. tread of  $2\frac{1}{2}$  to 3 in., instead of  $3\frac{1}{2}$  in., may be used in pens 8 in. wide. If pens are 12 in. high inside, as (b) in Illus. 46, wheel

may be moved down to about 1½ in. from floor in any such propagation pen. Wheels of 6 or 7 inch diameter afford nearly as much value and require less space. Of course, in solid floor pens where floor litter is used the wheel must be high enough to clear such material for free turning. The screw or bolt mounting this wheel should be back about 8 to 9 in. from front end of partition to allow complete clearance of front C.S. It is an open question as to whether any exercise wheel requires more space than it is worth in a pen less than 10 in. wide. If one builds 12 in. widths, just to have wheels in pens, that involves more materials and more space. Generous use of climbing strips appears to serve adequately in propagation or breeding pens. Wheels are considered a novelty item for display cages or for large pens of weaned young. Try one or two wheels for a few weeks before going to a lot of trouble.

## 26. Additional Notes on Housing

Metal may be used instead of wood in building any of these or similar pens. It is essential that a wood guard board or other device be employed for proper exercise of hamster teeth.

Those sellers of wood pens without front opening doors doubtless never heard of the guard board, which prevents young from falling out of the opened doors.

Regardless of the preference some builders may have for all solid-floor pens, the fact remains that a few pounds of excelsior will meet the nesting requirements of a number of hamsters in self-cleaning pens that might require a drayman to haul the shavings, etc., required to house the same animals in all solid-floor pens. Many laboratories are equipped with wire-floored pens and cages to avoid foreign substances on feet and fur of animals and prefer stock raised on self-cleaning floors. Who likes to handle an animal with filthy feet?

If a hamster tends to gnaw at any certain spot on the side of the pen, cover such spot with hdw. cl. or tin.

Hamsters seldom desire to nest or store food near the front door. If this does occur, lay a block of wood, 4x4 inches or larger, in such place until the hamster nests and stores food in rear of pen.

Cage paralysis may be caused by lack of exercise in pens with no climbing strips or in pens too short to permit running space, by lack of calcium in diet, by lack of vitamin D, or by contaminated food in pens without self-cleaning area.

The pen length has much to do with exercising runs of hamsters. Were it not for expense and space requirements, pens 28 or 30 inches long might be advised. However, 21 inches floor length appears to be fairly satisfactory from the standpoints of both pen cost and hamster health.

A short section of tree limb, preferably 3-forked or 4-forked and about 12 to 15 inches long, affords a lot of healthful exercise and gnawing for all grades of hamsters, sub-standard to exhibition. Just lay it on the pen floor with forked prongs toward the nest. Such tree limb, added to generous use of hdw. cl. climbing strips, will furnish all of the exercise hamsters may possibly need or use. It is strictly optional as to whether or not the caretaker so furnishes any of the pens. Growing weaned young derive special benefit from exercising aids of such a practical nature.

## IV

### HOW TO OPERATE A HAMSTERY

#### 27. Dietary Requirements and Feeding Schedules

Hamsters thrive on varied foods and feeding schedules. Since it is their habit to eat in small amounts many times during the 24 hours, they may be fed at any time of day or night. OMNIVOROUS in diet, their food is readily obtainable. No expensive commercially prepared special hamster food is necessary. In proportion to income from offspring, hamsters may be most cheaply fed of the domesticated small animals. Some writings by the ill-informed have led novices to believe the hamster to be vegetarian in dietary requirements. Strangely, such writings frequently claim highly cannibalistic tendencies of the animals under certain dietary deficiencies, etc. To those who desire to learn the true nature of the creature's hunger, the author of this book recommends that you offer a pen of hamsters some meat, either raw or cooked, and see how they relish it. They eat meat more greedily than any other food, unless perhaps tender crisp green foods when deprived of same for long periods. Meats do well as a part of their diet, but should not be the main food on their schedule. Governed by hunger and food availability, native life hamsters eat bugs, grubs, eggs, small birds and smaller animals, and gnaw bones left by beasts of prey. However, raw meats should not be fed to females, since raw meats may induce cannibalistic tendencies and encourage a per cent of mothers to eat their young. Were they vegetarian, this tendency would be absent, except in a negligible per cent of abnormals. Therefore, all meats to be fed to hamsters should be cooked or otherwise processed to eliminate fresh blood and live flesh or raw flesh odor and appearance. Bones remaining from meats baked, boiled, fried or grilled make excellent gnawing pieces for hamsters of all ages. Low cost commercial animal food pressed into blocks, cubes, chunks or pellets such as fed to dogs, rabbits, mink, foxes, calves, etc., and the better grades of breeder laying mash (pellet form) or poultry hatching egg mash (pellet form), containing approximately 20 to 25 per cent protein, are convenient foods, which animal and poultry foods furnish fish oil, wheat germ oil, minerals, etc., essential to best propagation. Some such convenient food should be included in any regular feeding schedule. Hamsters need to exercise their teeth, and these hard block and pellet foods furnish such exercise while bringing into the body essential minerals and vitamins conveniently and safely at minimum cost. Total feeding cost is small, for an adult eats only about a tablespoon of food per day, or 12 to 16 oz. per month. The fact that hamsters wean and sell at such an early age provides a food cost saving rather remarkable when compared to other small stock.

To keep hamsters in best appetite and condition, feeding schedules may be varied. A 3-day schedule may be followed for a few weeks; then changed to a 2-day schedule. After a time, a balanced daily feeding of both green and animal food may be employed, with grains added once or twice per week for variety. Whenever animals appear fed-up or any one food, change feeding schedule and their keen interest in eating is instantaneous. Rapid growth of young requires steadiness of feeding habits, and young ham-

sters develop at a remarkable rate. Feeding schedules will be discussed later in this chapter.

Hamsters are fond of all grains, but if fed too much field corn may eat only the germ end of the kernel. They eat almost all kinds of vegetables and fruits. The outer green leaves of higher moisture content vegetables, such as lettuce, cabbage, etc., have greatest value, although the animals relish the white inner leaves when fed them. Many kitchen and store vegetable trimmings are of the valued, sun strengthened, vitamin laden outer leaves.

Avoid feeding mushy foods, over-ripe fruits, mashed potatoes, etc., since these may dirty the pens, especially the nests, and invite odors, mold, worms, etc. Certain varieties of apples fed in quantities may cause digestive disturbances, although a little apple peel fed occasionally may do no harm.

With the exceptions of citrus fruits, bananas, garlic, onions, radishes and tomatoes, they relish the peelings, trimmings, flesh and seeds of practically all known fruits and vegetables. Kitchen peelings and trimmings of such usually furnish the total green food needed for 6 to 10 females with kittens. Larger commercial or mass producers of hamsters may readily obtain extra vegetable trimmings on a regular basis at little or no cost by arranging to call regularly for same at stores or markets where buying other merchandise as regular customers.

Hamsters are fond of nuts, raw or toasted, shelled or whole, though the shells of extremely heavy nuts may be just slightly cracked for them. They have a delightful time with peanuts and almonds in the shell, and are fond of table scraps, toast, vegetable tops, leaves and roots.

Hamsters kept as pets do well on almost any diet or feeding schedule. But high production of top quality requires feedings in keeping with expectations.

Such balanced feeding for high productivity may be followed in a 3-day schedule: 1st day—A generous feeding of whole grain. It is found more appetizing to have 2 or 3 different kinds of grains, and feed a different kind each grain day, although some owners prefer feeding mixed whole grains. 2nd day—Green foods. 3rd day—Pellet food, not in such quantity as to be stored in large amounts. Either dog pellets or cubes, or poultry breeder laying mash (pellets) may be conveniently obtained and both are highly satisfactory. One kind of such commercial food, animal or poultry, may be fed for a few weeks; then, if desired, change to another to give the animals a slight variation. In following the 3-day feeding schedule, it is highly profitable to feed small amounts of green vegetable leaves as extras on both grain and pellet days.

Another feeding plan bringing good results is a 2-day schedule: 1st day—Grains and vegetables. 2nd day—Pellets and vegetables.

A third plan is to feed pellets and vegetable trim daily. In such schedule, some grain or other variety of different food must be fed occasionally to prevent monotony in diet.

Hamsters are especially fond of potatoes, carrots, cabbage, cauliflower, celery, turnips, beets, etc., and also relish the tops of carrots, turnips and some other vegetables.

Green foods tend to prevent constipation in un-

weaned young caused by richness of pellet foods. Richness of the pellets must be balanced by green foods, which should be fed daily to unweaned young if pellets are in the pen. Some handlers prefer to feed larger cubes of animal food to mothers with pre-sight young, then small pellets from 15th day littler age onward. Unweaned young eat less large cube food. From the 15th day the likelihood of constipation decreases.

Hamsters are fond of certain freshly cut, unwilted lawn and field grasses. Try available green grass, freshly cut, to see whether they eat even small amounts at first. Grass that they will eat may be fed as a green food. However, its moisture may be too low to serve as the only green food in supplemental feedings to pre-sight young. See Chap. 50 for advice on supplemental feedings.

Diet without water as such is not advised, except in experimental procedures. Low moisture dehydrates the body, lowers both grade and number of young, and is unprofitable in general.

Hamsters need enough food to maintain food stores, or small piles of food near nests, at all times.

A tablespoon, or other long-handled spoon, is found to be especially suited to use in placing food in hamster pens if that food be grains, forcing feed mixture, small pellets, etc. Larger pieces of vegetables, large pellets and other food which may not pass through floor in self-cleaning area may be dropped upon that wire portion of the floor just inside the door.

Further data on feeds and feeding may be had by consulting the book, "Raising Hamsters for Science," 1946, by the author of this Manual.

For most rapid growth of weaned young, the author's forcing feed mixture given in Chap. 50 may be fed with green foods daily, with occasional addition of other food for variety.

## 28. Propagation

It is observed that of all mammals in domestication, both in fertility and maternal instinct the *Mesocricetus* Hamster females rank highest. Similarly, in fertility and amiability as sires, the males take first prize. A well-established hamstery needs 1 male to each 3 to 9 females, depending upon the breeding method followed and the number of persons helping with hamster matings. The sexual cycle of the female is approximately 4 days, a highly frequent mating instinct. Barrenness is rare. After mating, she is too busy raising families to care to be fondled by human hands, and may well be handled by use of an empty No. 2½ tin can. Female breeders are kept in their individual pens.

For experimental breeding and pet raising, females may be mated from approximately 40 days. If one desires to raise and sell standard quality stock, the males should be at least 14 to 15 weeks old, and the females should be at least 8 weeks of age, or older, for the first matings. To produce either highly superior or exhibition stock, females should be 3 to 3½ months at first matings. The sexual life of hamsters is polygamous.

Directed by preferences and purposes of individual caretakers and owners, three different breeding methods are used.

**Pair Mating:** The female to be bred is placed in a

lone male's pen, where she resides for several days. Some handlers leave her there 5 days, assuming that she passes through the mating cycle during which she is bred. Others leave her there until she begins to show size of having been successfully bred. Since the female may become combative toward the male after mating, and the male is so gentle in his manner of behavior, he may be severely damaged by her fighting him. For that reason, it is advantageous to use a male larger than the female. All considered, this is not a highly favored breeding method. Some handlers use two husky litter brother males in one breeding pen, which amounts to reinforced pair mating.

**Group or Colony Mating:** This time-saving method used by some large producers employs a large breeding pen 36 to 48 inches long, and 10 to 12 inches wide. Two or three males, preferably litter brothers, occupy this pen. 4 to 6 females are selected for mating, all placed in the males' pen at one time and left there from 10 to 12 days. An experienced eye may recognize female swelling by the 8th to 9th day and each such female so observed may be removed to the pen where she is to raise her young. By the 12th day all females should be removed, and the males returned to a regular size pen where they continue to live together. Then, the colony pen is cleaned and refurnished with new nesting materials, a new set of brother males added, and after a few hours or days another lot of females introduced to the colony pen. The exact date of mating of each female is uncertain, and much female fighting occurs, in group matings. The average producer does not favor this method.

**SELECTIVE MATING:** This is the preferred method for two reasons. First, the owner knows what he is doing, exactly why and when. Second, he is in charge and there need be no damage to either animal selected for such mating. Place one female in a lone breeding male's pen to mate, preferably after 6:30 p. m. due to nocturnal habits; which does not mean mating in the dark. The evening favors the mating instinct. Leave the female with the male for about 2 to 4 minutes testing period. If she appears unfriendly or desires to fight him, use the tin can at once to scoop her up and remove her to her own pen, and try her again the following day or night, until she accepts service from the male. If she accepts service, leave them alone as long as they have that friendly interest in each other, which may last 10 to 20 minutes. Then, remove her to a freshly cleaned pen furnished with nesting materials for her future family. For best strength of a male, and the quality of litters sired by him, he should not be used more than 2 or 3 times per week. After each mating, a two-day rest period is advised for him. Optional selective method: Some prefer to mate an older female in a pen housing two litter brother males, an effective practice. Female is handled in same manner as with only one male in selective breeding.

A mated female should be given normal food and care, with special attention as to adequate nesting materials by the 12th day in gestation (profit or pregnancy), that nest may be in final arrangement by the 14th day, as she rests in the nest most of the time during the 40 hours preceding the litter's birth. During cold weather, the prospective mother may be given shreds of discarded clothing, cloth trimmings or torn newspaper to line the nest in advance to provide great-

er warmth for the naked newly born. Young do not fur to any notable extent before the 6th day. During this 40-hour resting period, she should not be shown to guests; neither should she be unduly coaxed to come to the pen door for any attention. Unless handling is absolutely necessary, she should not be touched in any manner after she begins to show size. When bred, she loses no time bringing her 4 to 16, rarely 18, babies into the world. They arrive in less than 16 days (average 15 days, 21½ hrs.), and do not open their eyes until 15 days old, and she weans them 5 to 12 days later. Neither she nor the young should be handled during the first two days after their birth, lest in her fear she instinctively and defensively take some or all of them into her cheek pouches during her annoyance, much as she might attempt to do in wild state to carry them from the presence of a snake or another female hamster whom she felt unequal to fighting off. Since she cannot escape the pen with them, if you handle the tiny young in her presence and remain with her she in desperation may take some or all of them into her cheek pouches and hold them there until they smother. In which case, she may eat the dead and thereafter the living, becoming a discard or cannibal to probably destroy succeeding litters.

During the first 40 hours after birth of litter the baby hamsters emit a peculiar suckling cry. It is very faint, but continues for a few moments after the mother leaves them suddenly to greet the caretaker at the door, and it may be heard while they are engaged in suckling, especially until they have learned how to quickly grasp the mother's mammae as soon as she hovers over them for nursing. If some record of the mating has not been made to determine the date of birth, when the caretaker notes the earliest suckling cries from a nest he should thumb tack a record card or slip of paper to the door and enter thereon his best estimate of the time of birth of that litter. This record, however made or determined, is the guide as to when the nest may be inspected for culling, etc. See Chap. 30 on culling.

Undisturbed, hamster females usually make wonderfully little mothers; and by the time the eyes of the young are opened she permits free handling of her babies. If one will let her mind her own children until they are able to see, she will do her part faithfully with her loyal maternal instinct. This is no handicap in raising hamsters, for practically none become cannibals under normal care. Do not handle the newly born young in her presence. By the 8th day, the young independently eat any food the mother stores within their reach. Pen widths of 9 inches or less place the maximum amount of stored food within easy reach of the pre-sight young. For some time previous to the 8th day, to supplement her milk supply as well as to teach them to eat, the mother has been chewing and feeding to them small bits of food. By the 10th day, the young are making brief excursions from the nest and doing some exploring of the pen, returning to the nest by instinct or by the mother's carrying them cat-kitten fashion by the neck or back. By the 12th day, they eat heartily and nest behavior resembles small kittens. Excreta notably increases from about the 15th day. If desired, for extra cleanliness, when it may be observed that the eyes of the young are open, pens may be cleaned and fresh nesting material placed in rear of pens. While satisfactory weanings may regularly

be had without this additional cleaning of the pens, this is a profitable practice. An extra generous feeding should be placed at F.P. before the mother is brought back to her home pen and young. Nursing diminishes sharply from the time eyes open, and the litter may be weaned from the 18th day onward. The recommended weaning period is approximately 20 to 27 days from birth, according to different production purposes.

Good stock properly raised may weigh one ounce or more and be fit for long-distance shipment at 21 days. Kittens for future breeders may be left penned with mother until 24 to 27 days if one observes daily whether mother is merely playing or actually fighting them. If she fights them, wean kittens at once.

After a few days rest, she may be mated again, which allows a litter about every 6 or 7 weeks in continuous production. After 5 or 6 litters, the mother is discarded from the breeding group and is replaced by a younger female who continues that pen's production. Little wonder that science has a careful eye on this unique, odorless, super-prolific nugget of gold, a laboratory animal par excellence. Every new use for such laboratory animals increases demand. She does a good job of weaning up to 10, sometimes 12, standard weight (1 oz. or more at 21 days) kittens per litter; and, with help of supplemental feedings (Chap. 50) may raise up to 14 to 16 of same weight and quality.

Domesticated hamsters engage almost equally in day-time and nocturnal activity. They normally sleep most during mid-day and mid-night. They are never noisy; their vocal ability being limited, in fact, faint. But they make up for it in activity, tricks and capers. On hearing one approach, squirrel-like they sit up or cling inside the door anxiously awaiting any attention. Males have a special fondness for being handled, sitting upon one's hand, etc.

## 29. Temperature

Hamsters stand a wide range of temperature. Any basement, cellar or room in which one may be comfortable while tending them may be suitable for raising hamsters. In summer, avoid sun's direct rays shining into the pens.

A 70 degree average, with a 5 to 10 degree variation up and down, is considered ideal for high productivity in domestication. But fairly standard production occurs in quarters where temperature does not long remain below 45 or above 90. In unheated quarters in extreme cold areas of the U. S., production becomes sub-standard or ceases during the three or four coldest months. In extremely hot sections, intense heat may lower production during two mid-summer months unless some protection from extreme temperature is provided. Thus, the preference for cellar or basement hamsteries. Hamsters mate better in a temperature of 65 upward, best in 70 upward at moment of mating. While most females mate well in 65 to 70, in winter season one may bring slow or indifferent females into 72 to 75 degrees for about 4 days. Most such may become receptive during that period. Temporary drops to 40 and below have brought no apparent harm to unweaned kittens. 50 upward permits normal weanings, but they do better in 60 degrees upward. In living quarters below 45 degrees hamsters enter broken hibernation, during which small profits may result from matings. Hamsters are raised from

the tropics to Alaska. Reasonable ventilation at all temperatures is profitable. By weaning, hamsters are ready for most exposures encountered in shipment anywhere in this country.

### 30. Culling

Culling reduces litter count and thus affords better milk supply for kittens to be nursed to weaning; therefore, their more favorable development.

Different production purposes direct the litter culling process. Four classes of weaned litters may be listed: 1—Maximum without runts (10 to 16) for pets, etc., regardless of weight standards. 2—Maximum number of a specified weight with uniformity (4 to 14). 3—Maximum weight per kitten, regardless of number, to be weaned at approximately 3½ weeks. 4—Sex ratio, or sex controlled weanings, which may be combined with either 1, 2 or 3. Both standard and sub-standard nest culls removed to control either sex ratio or number weaned may be preserved for fish bait as per Chap. 37.

Again, do not handle pre-sight young in presence of the mother. Remove her from the pen if you wish to inspect the nest of young. Disturb the nest as little as possible. Then place her back in the pen with a fresh supply of food to occupy her mind in the storing of same. Schools, laboratories, or others inspecting the same nests repeatedly, may omit some regular feedings or great surplus food stores may accumulate. Be careful not to disturb the structure of the nest while removing any such excess stored food. Do not remove her from pen more often than necessary; but, when you do, it may be well to place her in an empty pen, pail or tub with food or nesting materials therein with which she may fill her cheek pouches to shorten her nervous period away from her young. Remember, there is risk each time you so inspect her nest of young unless you have acquired skill in it and extended knowledge of her emotional nature. First sex ratio and runt cullings may be done from 3rd to 5th litter days by the experienced; from 5th to 7th days by the novice. The foregoing suggestions are merely words of caution and guidance given technicians for working purposes and to novices who feel led to early satisfaction of their curiosity as to the nature of the newly born and unweaned hamsters.

Rear doors, as in author's preference pens, offer decided advantages during nest inspection. They permit careful examination of litter with no disturbance to the nest. Each time one uses them, the rear inspection doors are worth the time required for their construction.

Avoid adding foreign odors, such as tobacco smoke, etc., to either nest or young. Kittens may be lifted out into a small basin lined with clean cloth or paper. Sexes may be separated on basis of Illus. 53. If unable to distinguish sex as early as first inspection, return all except notable runts to the nest, then replace mother to her own pen, and wait until female mammae (nipple) lines are visible with great definiteness. When culling for sex, select the best, largest kittens in the sex ratio desired to be returned to the next. Culled young not saved for baits may be fed to any flesh-eating creature, other than hamster, that may be in need of fresh meat. A light tap on the skull instantly dispatches kittens, as in the case of any other tiny

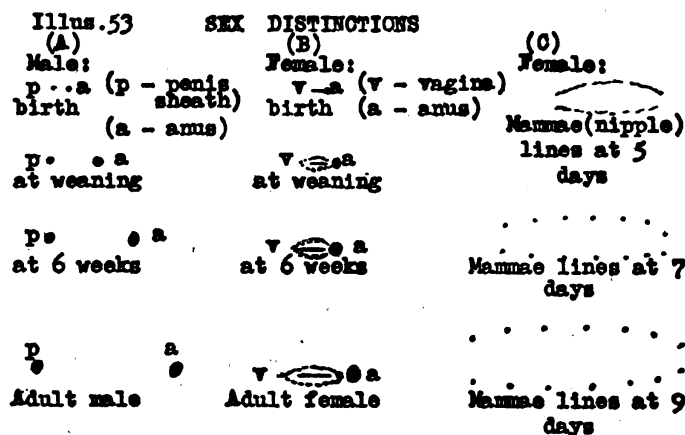
young. Thus, no element of cruelty is involved. Culling of litters is practiced in production of finest cat, dog, and other stock, so the custom of culling and dispatch of culls is not new. However, the hamster is a small animal and skill must be exercised in successful culling practices. At birth, litters may contain 4 to 18 kittens during the mother's best production, female kittens frequently outnumbering males. In uncultured, poorly cared for litters, the mother's pampering of male offspring usually leaves female kittens in the minority. Amateurs who let nature take its course are heard to say that hamster production shows males in the majority. Skill in culling, feeding, and other care reverses the sex ratio in well-managed weanings, and permits the owner to control the pattern for production. The average mother hamster, properly fed, etc., may nurse 6 to 10 weanling kittens of standard weight, readily permitting 30 to 40 kittens per female's productive life of 5 to 6 litters, and that output without social or supplemental feedings as hereinafter provided for. Although pet stock need not meet laboratory or breeding stock requirements, for best production, the runts (distinctly undersize kittens) should be removed by the 7th to 9th day and litter count held within reason. For production of best possible young breeders, 4 to 6 young should be the maximum number weaned without supplemental feedings, or 6 to 10 with supplemental feedings, depending upon size, age and quality of the mother.

Special advantages in culling for sex ratio lie in the fact that one may raise the right proportion of females to sell for breeders, or may raise all males if filling laboratory orders specifying same. Cull according to your production purpose, and save yourself from feeding unwanted animals.

For convenience in culling, feeding and other servicing of pens, there are advantages in mating all females to be housed in the same 4-pen unit so as to litter at about the same time.

### 31. Sex Distinctions

As shown in Illus. 1, the male adult is distinguished by his elongated rear section. The female squares off bluntly at the hips, as shown by the F and arrow pointing to the dash line showing how female hip and rear section appear in contrast when placed upon picture of the male for comparison. The male elonga-



tion of the rear develops rapidly from the 15th day until he is approximately 12 weeks of age. The sides of this protruding rear are usually lighter color than



6 days later, leaving 2 males and 7 females to wean; litter wt. of 11 oz. at 21 days; one underweight was removed; 8 young breeding stock selection quality weaned at 25 days. Female was weighed 5 days later, 4½ oz. adult wt. at 3 months, 22 days. Rebred to same male, she weaned another heavier litter of choice breeding selection quality. Showing size after her 3rd breeding, she was shipped to the science department of a state college to fill a special order for late prenatal studies specimen. It pays to weigh litters at 21 days. That is the only dependable way of grading production weight and of knowing whether a female is capable of delivering profitable weight in numbers to be weaned.

### 33. Replacements

After 5 or 6 litters, the female's best production is over and another younger female replaces her to continue that pen's production, which in a year of continuous production may run from 40 to 70 or more weaned young of standard weight, depending upon quality of breeding stock, care, and purpose for which young are raised. Replacement females should be saved from the production of mothers who give birth to greatest numbers and also best nurse culled litters to weaning.

After each litter is weaned the pen should be thoroughly cleaned, whether the same female may be returned to it or a new female may be selected to replace her. The mother hamster should be given about 4 to 6 days rest after weaning her kittens before she is remated. For extra quality breeding stock and exhibition stock, 8 to 10 days rest is advised. Under inadequate rest, runs may become numerous in her succeeding litters. During rest period, the Forcing Feed Mixture and plenty of green foods will prepare her for mating itself as well as help restore her weight to normal. Her normal adult weight is arrived at by weighing her about 6 to 8 days after weaning a litter after she is 16 weeks of age, regardless of the age at which she had her first litter. Females showing adult underweight at this age should be replaced and disposed of or dropped back to sub-standard classification. Otherwise the standard of production may deteriorate.

### 34. Care of Weaned Young

Weaned young are transferred to a clean pen and given normal feeding. If more rapid growth is desired, feed Forcing Feed Mixture, greens, etc., same diet as resting production line females. Young should be sex separated by fifth week of age, males in one pen and females in another. For accurate records, each pen should have a card or tag showing its litter symbol or number so that mating selections may be taken from either pen and pedigree completed if desired. Young remain in such pens until sold or placed in local production. Exception: Exhibition stock is placed in individual pens by 7th week to avoid scars or torn ears in early fighting. Never buy a so-called show or exhibition animal with a slit or torn ear or any other scar.

Laboratory stock is frequently shipped upon weaning. If not, weaned young are sex separated and housed in large pens for stock of approximately the same age. Pens about 2 by 3 feet, and 10 to 15 inches high, comfortably house 10 to 15 adults. If over 4 weeks when shipped, animals are sexed into male group and female group compartments in shipping trays or containers.

### 35. Operations on Commercial Basis

The commercial producer of hamsters uses the same pens, feeding schedules, etc., as previously set forth. Before buying breeding stock, he will give most careful consideration to the following phases: Housing and pens, quality of breeding stock, dietary requirements, propagation, costs of production, likely markets in his shipping area, control of sex ratio in production, special feedings, production of super-litters, prevention of early discards, laboratory stock care and handling, pet and novelty production, beginners' mistakes and how to avoid them. He will give thorough attention to all phases set forth in Parts V to IX in this book.

## V

### GENERAL USAGE OF HAMSTERS

#### 36. Pet and Novelty

While the hamster is primarily a laboratory animal, numerous other uses make him profitable to raise.

**FUR:** Hamster skin is too tender for fur use other than garment trim. For that, it is beautifully and delicately marked in its natural colors. Consult furriers for specific details.

**PETS:** Since the animals are both new and unique, pet and novelty production is profitable. Many of the larger pet shops handle hamsters when they can get them regularly from local or nearby producers or from satisfactory shippers. For production to meet this class of sales, many of the rules previously given for production of choice breeding stock selections may be set aside to the degree accommodated to environment and purpose served by the animals, but looking well after those details essential to comfort and health.

**NOVELTY:** Hamsters are featured as novelties at carnivals, fairs, shows, etc.

#### 37. Baits

**FISH BAIT:** Nest culls may be preserved in pint or quart jars containing formaldehyde, alcohol, salt brine or other suitable solution, or by freezing.

Immediately after a hard wind or driving rain you may doubtless find small, pre-feather age, dead sparrows or other small birds fallen from nests as storm casualties. These may be added to preserved hamster nest culls and used the same.

Preserved specimens may be packed in smaller 2 to 4 oz. jars as desired. These culls may be used for or sold for use as game fish baits.

The author does not recommend the use of live hamsters for fish bait. His main reason is respect for the feelings and interest of those persons who consider the hamster as a pet. But as a matter of scientific honesty, it should be said that it is difficult to conduct hamster swim tests and water chill tests on them in waters inhabited by game fish. The newly weaned hamster so resembles the mouse that the fish may be avoided only by conducting such tests in shallow places or runs not frequented by the game fish. Of course, if game fish are not present in waters used, hamster swim tests are among the most interesting observations made on the creatures. They inflate their cheek

pouches soon after swimming begins, and the buoyancy afforded thereby sustains them for long periods, so that in surface swimming they rival some of the aquatic animals. The adult hamster in water appears to appeal to the large game fish sense of hunger, or desire to fight, to about the same extent as might a baby rabbit 3 to 4 weeks of age, or a very young muskrat or duckling. Most game fish under 2 or 3 pounds will hardly accomplish more than to maul and rough the adult hamster for a moment, possibly pulling him under momentarily. In case he is rubber-banded behind the front legs, there is some danger of a heavy fish stretching the band, loosing the hamster. A rubber band ahead of the front legs is not advised in the swim or water chill test since such a band may prevent inflation of the cheek pouches and in that handicapped situation the hamster may not be able to swim high and well enough in rough water to stay a sufficient time for an adequate test. A hook, from which the barb has been removed, and the sharp point dulled, may be looped-over twice by the rubber band about the hamster just behind his front legs for most such tests as here suggested with rod and line.

However, the author has no hesitancy to go all out in advising the use of frozen or preserved pre-sight nest culls for game-fish baits. Most fishermen know the use of large grubs, dead baby mice, rats, etc. To anyone not aware of the frequency with which baby birds, mice, etc., fall into streams during high winds, storms, and invasions of their nests by birds and beasts of prey, let it be said that such nest losses are both common and frequently to such extent as to be rather amazing to the average person. Naturally, the pre-sight hamster culled from the nest, whether to attain some maximum for the service of science or to assure better breeding stock prospects from the remainder of the litter, is a near perfect duplicate of a baby mouse or baby rat on a comparative age-size basis. The fact that the hamster has little tail has never been analyzed by the game fish. And the grand-daddy of the run or pool has doubtless many times bumped aside the lesser fish in his rush for such tempting food. If desired, preparatory to immediate bait usage, a number of such preserved nest culls may be soaked in water for a half hour or so to remove preservative flavor and odor, and by use of a medicine dropper may be injected in each bait some A & D oil, anise, fish bait oil, or any preferred attractor. Some fishermen and hobbyists raise hamsters mainly for hobby fun and income, but the author suspects that they would still raise hamsters were there no market other than the just mentioned fisherman's use of these nest culls. One fisherman sells another breeding stock for that purpose. More than one such salesman has paid the expense on a major fishing trip by such sales, animals delivered on the spot or shipped later. Several hamsters of any age may be carried for days in an empty minnow pail. Two such pails, one for older males and one for younger females, afford a fair travelling hamster store. Buyers carry them home in similar containers, tin pail, etc. Well, that is but one way of marketing hamster production to a profit!

If for any reason one desires to wean a maximum litter number of small hamsters, simply omit culling such litter and feed it and mother daily on a low protein diet of grains and greens. A meager feeding of pellets each 4 or 5 days. Supplemental nest feedings

as per Chap. 50 should include only vegetables and rolled oats, and should be fed sparingly, daily. Wean young at 19 to 20 days and continue low protein diet. At 21 days, such young may weigh  $\frac{1}{2}$  to  $\frac{3}{4}$  oz., resemble the medium size mouse and continue so for some time. Such runt-like young make inferior breeders.

**ANIMAL LURES:** The lateral pouches in the lower vagina of the breeding age female contain quantities of constantly forming cornified excretion, which may be taken in a routine manner, as vaginal wipings, on small pieces of cotton about the size of a pea and placed in small capsules to be sold as, or used as or in preparation of, baits for foxes, mink and other animals. Tweezers are advised for handling cotton while taking wipings and inserting same into capsules.

Nest culls and discarded adults, or parts of same, make good trapping baits for flesh-eating animals.

### 38. Other Uses

**ELEMENTARY SCHOOLS:** Possibly the most useful work hamsters may perform outside the laboratories is that of instruction in the processes of life by their rapid reproduction and maturity of offspring. Children are fascinated by the unique habits of Holy Land Hamsters, charming cage pets. Males climb upon one's hands and arms as permitted, and several males of about the same age may congenially occupy the same cage or pen together. Advanced educational uses are presented in Part VI. Also, see the illustrated folder, "School Hamsters," by the author of this book.

**TAXIDERMISTS:** Golden Hamsters are convenient specimens for mountings. Curio stores, gift shops, importers, school supply houses, etc., sell them singly and in family groups. A good field for the alert taxidermist.

**HOME, SCHOOL, PARK AND ZOO SIMULATION OF NATIVE LIFE:** An outdoor summer cage constructed of hardware cloth on 3 by 3, 6 by 6, or 12 by 12 foot floor plan will accommodate from 10 to 50 male hamsters, which if matured together may live thus in a congenial manner in such space. 12 by 12 foot cages may well be partitioned to accommodate a mother hamster with litter in one side, and a male group in the other. Cage should be on a well-drained spot, sheltered by trees furnishing adequate shade from direct sunlight during the heat of the day. A small, heavily constructed box, or a small pile of large rocks, in a corner for nesting quarters . . . water container or shallow-edged pool . . . barberry, cacti, or rock garden plantings may precede use of the cage . . . a slanting forked limb from a dead tree, limb 3 to 5 inches in diameter, may be added. Such quarters are satisfactory anywhere in the United States during summer months, and year around south of the 35th parallel. If wire flooring (hdw. cl.) is sunken 2 to 4 feet below ground level, animals will burrow and may exist in most regions less than 5,000 feet in elevation, from approximately the 40th parallel southward through the United States, indulging in broken hibernation during winter.

Young culls and older discards may be used for food for flesh-eating animals in parks and zoos, on fur farms, etc., also for flesh-eating snakes and birds.

## VI

### LATEST SCIENTIFIC USAGE

#### 39. Allied to Science

Hamsters are peculiarly allied to the cause of science. They were discovered by scientists, captured by scientists, domesticated by scientists, and are now increasingly used by scientists.

The hamster has wide usefulness in both peace and war. Records of research usage of hamsters of any species date back to 1919, but not until the last world war was the hamster's true merit widely recognized.

#### 40. Laboratory Uses

Early laboratory research included work in influenza, syphilis, tuberculosis, etc. Later, leprosy and various oriental and tropical disease tests. By 1946 hamsters came into extensive research and analysis usage by clinics, leading laboratories, and manufacturers of medical and biological products. Physicians, laboratories, scientists and medical technologists were procuring investigation subjects for private observation, experimental propagation, dissection, and trials in varied routine and special tests. This expansion continues. Since few users attempt to raise locally the specimens required for their laboratory schedules, upon ascertaining research adaptability and laboratory analysis worth, many of these may be ordering greater numbers regularly from small stock producers. Laboratories use hamsters of all ages, and in both sexes. Standard weight animals from 3 to 12 weeks of age are preferred for most routine laboratory work; some requesting 4 to 9 week stock.

Among recent laboratory uses, hamsters figure in the study of leishmaniasis, cancer, dental research, jaundice, schistomiasis, fungi, hereditary diseases, equine encephalomyelitis, leptospirosis, observation of biological and behavioristic factors, pre-natal stages in mammals, etc.

Because of the ease with which hamsters may be infected under laboratory methods, and the promptness of certain reactions, some leading clinics have already pronounced them superior to cavy in infectious and hereditary disease work.

Hamster usefulness in standardization of dietary supplements, development of serums, analysis and dissection study of many diseases, etc., is already well established.

War-time research designated the hamster a laboratory animal of unusual adaptability and merit. Wide usefulness in virus research and analysis, veterinarian studies, pathology, general bacteriology, serology, parasitology, metabolism, embryology, histology and other work, as well as the amazingly rapid reproduction and early maturity of these comparatively new laboratory animals accounts for the increasing scientific importance of and demand for hamsters.

#### 41. Value of Short Gestation Period

The importance to science of the hamster's briefness of gestation (pregnancy time) is not quickly grasped by the average mind. A female hamster may mate, give birth to and wean a litter while a cavy (guinea pig) female mated at the same time goes only half way through her term of gestation. Furthermore, the ham-

ster's one litter may sometimes equal or exceed in both number and usefulness the cavy's average total yearly production. The hamster female may be mated again after as short a resting period as 4 to 8 days from weaning each litter. Usable in extensive medical and bacteriological work from 18 days onward, and ready for long-distance shipment at 20 to 22 days from birth. The animal develops so rapidly that it is ready for mature adulthood's major dissection work at an early age. Physicians, technicians, and professors, as well as students, appreciate the ease with which this unique animal may be handled, experimented upon, or dissected, since it weighs approximately one-quarter pound at 13 to 14 weeks. Such size takes it out of the laboratory mouse class for such work and permits the hamster to rival or excel the cavy and rabbit in much research, diagnosis, and hospital laboratory specimen analysis.

#### 42. Laboratory Handling

Normally, unless badly mistreated, males of all ages may be handled freely at all times. Hamster females tend to become somewhat pugnacious from about 7½ weeks of age. They do not jump at one's hands, but move quickly and at times bite while struggling for freedom. Care should be exercised to avoid being bitten by such females while using naked hands to handle them. A No. 2½ tin can is more practical than the bare hands. In clinical routine, the use of a laboratory animal holder on adult females is advised.

For routines requiring a larger ratio of either sex, give special consideration to nest culling for such purpose as directed in Chap. 30.

Marking, spotting, or painting laboratory animals for identification of individuals in routine and special tests: Aniline green, methylene blue and gentian violet, in purified form suitable for medicinal use, are satisfactory for identification dyes or stains after dissolved in alcohol and diluted with water to consistency of temporary stain. The three separate stains may be prepared for a few cents and in brief time.

A minor detail in technique: Cheek pouches should be avoided in all needle type administrations to hamsters.

Laboratory Pens and Cages: Small animal cages such as used to retain rats are satisfactory. Metal cages are highly satisfactory, more especially if modern self-cleaning floor type cages are used. Hamsters raised on self-cleaning floors handle better in laboratory, since already adapted to modern pens and cages. Hamsters may be retained, penned in groups, for long periods. Growing hamsters may be penned with rats, except that hamsters tend to chew rats' tails until even large rats become afraid of hamsters. Group penning of one to two dozen growing males continue to do well in pens approximately 2 by 3 feet. Once a mature female has been penned separately for any length of time she may fight others when first returned to a group pen.

The cost of hamster feeding, in either retaining pens or in full breeding production schedules, is only about one-third that of the cavy.

#### 43. Hamsters in Education

Progress may be notably advanced in junior high studies in elementary zoology, general science, etc., by use of hamsters. Natural tameness and adaptation.

An ideal semester propagation animal for high school observation and laboratory study—a reproductive wonder.

College and university laboratory animals for courses in zoology, general bacteriology, comparative anatomy, embryology, animal ecology, dissection and microscopic anatomy of vertebrates, etc. The pre-natal period, averaging 15 days, 21½ hrs., and the pre-sight period approximating 15 days, represent a numerical equation or balance unknown elsewhere in the animal kingdom. 31 small glass containers, occupying little space, may preserve a complete cross-section daily history through the combined pre-natal and pre-sight stages. A classic specimen for systematic study of embryo, fetal mass, pre-natal bone and tissue . . . born with well-developed teeth.

Post-graduate and medical: Unusual adaptability in virus research and analysis, pathology, veterinarian studies, serology, parasitology, metabolism, histology, etc.

For additional data on educational uses, see illustrated folder, "School Hamsters."

## VII

### DEBUNKING THE RACKETS

#### 44. Half-Truths in Advertising

Laboratories need thousands, and this need is currently met, the larger deliveries made by larger commercial hamsteries out of their own production. Competition among larger hamsteries for both laboratory and breeding stock sales is keen. The advertising that "laboratories need thousands" is a half-truth, misleading to the novice, and may lead many to unwisely over-buy when obtaining their initial breeding stock. It is not advisable for anyone to expand production into commercial volume without first making satisfactory arrangements for marketing such volume of production. It may be observed that to get profitable sales for small stock one must go after those sales. Fair and successful marketing methods are fully presented in Part IX.

"We buy back" is another sales getter in advertising. If interested in such deal, it may pay to first investigate as to what age, weight, kind, when and how many they buy back and at what prices, and who pays transportation charges. A check-up may disclose that many laboratory animal brokers average to pay about one-half laboratory market price on hamsters, and that breeding stock brokers pay about one-half to two-thirds laboratory market price. Having mistaken ideas about selling back, one may easily over-invest in purchase of his foundation stock from some operators.

Here is the line one sucker-stringer throws: "Make big money by buying your breeding stock from us. We buy back. Start with at least 12, 24 if possible, so you may make larger shipments." It hurts less to wait a while and swallow such bait in small pieces, ordering only a pair or trio to see how one is treated. Any outfit may readily obtain sufficient nice-sounding testimonials from one per cent of its customers, and skin 99 per cent. Therefore, the honest like to be checked-up on to reveal their true reputations. It sort of

separates the sheep from the goats. Get your banker's or lawyer's opinion of any breeding stock sale and buy-back contract offered you before you invest. See if the terms stated legally mean what you think. Many now wish they had heeded this advice. Others are glad they did so. By no means are all buy-backs rackets. But it is a fact that, to the beginner, the crooks do have the smoothest sounding deals.

Remember, that to get any kind of really profitable and regular sales, one must go after them. With this fact in mind, one may more profitably start modestly and for the first six months learn about the markets that bring the best profits.

#### 45. Pedigrees and the Black Market Mind

Several operators have been giving the impression that their pedigreed stock might be superior to most other, and thereby have taken 50c to \$2.00 extra per animal so sold. Many innocent beginners have lost good friends by unknowingly misrepresenting the value of such pedigrees or animals sold with such pedigrees. Incidentally, while the catch of suckers hooked in this game appears to be lessening, too many of the financial failures among beginners in the hamster industry feel that they were misled in this fashion.

A "black market" turn of mind may collect excessive prices from those who are unaware of the usual fair prices charged by the average producer. Such mind may depend mostly upon placing his advertising in periodicals used by few or no other hamster advertisers. Some buyers admit paying double to triple prices for hamsters bought before they learned of any other places from which to buy the animals.

#### 46. Expensive Advice?

A kind of consultation or guidance service is offered hamster breeders under such names as club, breeder's research, a dealer's name, association, cooperative, etc. Most such services offer all sorts of information, but may carry a footnote "providing such information is available," or "according to availability of information." Not to discount the possible value of general advice, but the average beginner signing up for such service may do so mainly for marketing advice, thinking that upon his request for names of places to sell hamsters he will receive by return mail a list of, or at least a few names and addresses of real people, laboratories or other users who will assuredly and regularly buy what he has to ship to them. He may learn differently, and realize that he must look up his own markets, advertise for them, etc. If he becomes resentful enough to threaten to expose their methods unless they immediately refund his money or furnish actual names and addresses to which hamsters have been sold, he may then receive such addresses. Upon writing them, he may learn that the buyer once did buy from the recommender, but has since found a more desirable source of supply. Upon writing the service again, he may be given the addresses of some dealers who live far away, and who may pay about one-half laboratory market price for stock prepaid to them, or who may be buy-backs requiring him to purchase some new breeding stock from them before they will consider buying any of his production. So, the dollar or two per year for such service or advice may be expensive and he may consider even his postage spent corresponding with them a distinct loss. What are the alternatives?

THREE: (1) Read regularly the hamster articles and discussions appearing in reliable pet and small stock magazines. (2) Although a busy man promoting a large commercial project cannot spare time to write personal letters of much real value to more than a few correspondents, the average hamster breeder may easily locate a few other breeders with whom he may correspond, exchange ideas and information, and perhaps visit personally. Study the hamster classified advertising section for such names. (3) It is recommended that the reader carefully study Part IX, "Marketing Hamster Production," to learn the facts and to obtain guidance as to the most profitable and plentiful sales outlets within easy shipping distance from his own home.

#### 47. Albino Racket

Certain racket-minded operators have estimated that, if and when available, the first thousand pairs of pure white hamsters might bring \$25.00 per pair, and other thousands might bring \$10.00 per pair. Some racket hope! Since 1942, commercial handlers have dreamed of white or near-white hamsters to sell at some such premium prices. During the war the author operated a small research hamstery. Certain laboratory survivor females under medical care littered varying numbers of pale-faced to white-faced young. 90 per cent of the female offspring bred, unless given medical care, died at termination of pregnancy or produced runts that died during pregnancy or at termination thereof. Strangely, the white-faced male offspring frequently carried better markings but transmitted less white in matings to standard color females than did white-faced females in matings to standard color males. A racket-minded, but not medically minded, visitor paid an extravagant price for a pair of these animals. The female died before delivery of her young. Still dreaming of a strain of white-faces, the racketeer obtained another female, but the same result followed. His male sired only fading white traces in offspring from standard color females. Several such males, along with normal stock, were shipped to a doctor in California but without specific information as to the derivation of the white-faced males. The white-faces created considerable stir of interest among many breeders who learned of them. Too great a per cent lacked important qualities required for normal reproduction. Thus, the author is pleased that no expert in genetics decided to promote them commercially. The *Mesocricetus Auratus* has great stability of standard coloration in the pattern for the species.

## VIII MONEY-MAKING SECRETS

### 48. Profits

Even though one's hamstery may be a hobby, he prefers that it may operate at a profit. Thus, each money-saving or money-producing idea has real value. The hamster is still comparatively new to wide and general usage. While a steady stream of laboratory markets is opening, the stream is not a flood but a gradually increasing flow. The bang and boom are only in commercial advertising, and those who fall for such may "go boom." Nevertheless, a conservative investment in hamsters, wisely handled, may bring highly satisfactory returns. For those who already have small animal and poultry stock, and merely wish to supplement such income, hamsters may offer an attractive addition to their set-up.

Operating on a strictly honest basis, the larger the hamstery the smaller the per cent of profit on investment, due to the fact that a larger per cent of increased production must depend upon laboratory markets, the lowest priced sales. A small hobby hamstery, 6 to 8 breeding females, with production sold for breeders and pets, brings the highest per cent of profit.

### 49. Production Secrets

Control of sex ratio in weaned young, as previously presented, is one of the most profitable practices.

As stated in Chap. 6, most of the author's work with hamsters is after 9:30 p. m. This includes matings of breeders. The most productive matings recorded occur between 9:30 and 11:30 p. m.

A female hamster does not always successfully breed with each mating. She may be tried again with the male 3 or 4 nights later. Some may remate although already bred.

A mating room temperature of 74 to 78 degrees makes highly favorable quarters for females from time of weaning litters until such mothers are to be rebred. Slow mating females may be helped thereby. Normally, 70 to 90 degrees is considered conducive to good matings, although many do remarkably well from 60 degrees upward, and exceptionally well from 65 degrees upward.

Do not overlook saving and preserving nest culls for fish bait as per Chap. 37.

Sub-standard stock producing for pets, culls to be used for baits, etc., may wean litters of 6 to 16.

Full standard animals for choice breeding stock are best raised in litters of 6 to 8, not more than 10. The amount of mother's milk per animal during the first 10 days of litter life is too important to overlook earliest possible culling for sake of increased milk supply per kitten to be weaned.

Superior, extra choice, and exhibition stock weaning averages vary from 3 to 7, according to quality, care, and production purpose controlled by the handler.

In determining the production purposes (Chap. 30), three profit angles enter according to standpoints of hamsteries operated. A small hobby hamstery produces to sell small numbers, but in the highest possible fair price range. A small commercial hamstery may wish to sell best grade breeding stock at best current prices for same, but also may pool or cooperate with another producer to fill laboratory orders. The large commer-

cial hamstery must meet all competition, maintain a full-time business with hired help, heavy advertising schedule, etc. To the novice, a few such larger operators may appear to be specializing in breeding stock of highly superior grade, but to the laboratories each such is just another source of laboratory animal supply.

Much of the finest breeding stock in the country is produced in hobby and small commercial hamsteries operated by those who really enjoy small stock and have thoroughly informed themselves in the field of genetics. One of the best ways of adding new blood is that of exchanging males with one such producer and females with another, exchange being made on age-weight basis.

Hamsters seldom start the habit of urinating near the nest in pens of 8-inch width. When they do, the habit may be broken by placing a 2x10x12 piece of board upright along the inside of the pen, starting at the back and running forward. This narrows the nesting area 2 inches, but does not narrow the bare area of the floor where the animals obtain their exercise.

#### 50. Special Feeding Advice

If you have a garden, plant extra amounts of carrots, loose-leaf lettuce, etc. Sun strengthened out leaves of vegetables do most for hamsters. For that reason the loose-leaf lettuce is a preferred all season vegetable that may be depended upon for about six months of the year; less time in the north, more time in the south. Hamsters like both tops and roots of carrots, and carrot roots are good for moisture content food for stock in shipment. Most garden vegetables are eaten up entirely or in part by the animals. Exceptions noted in Chap. 27.

Domesticated hamsters are not overly fond of many American grasses. To avoid financial loss, one should let hamsters try samples of any dry or baled grass or hay before buying same in quantity.

The animals are fond of peelings and cut or diced portions of sweet and Irish potatoes, beets, turnips and similar vegetables, as well as leaves of cabbage, etc.

**FORCING FEED MIXTURE:** Ingredients—1 heaping tablespoonful of iodized table salt;  $\frac{1}{2}$  cup of A and D feeding oil; 1 cup of cane molasses; 2 or more tablespoonfuls of wheat germ oil; 25 to 35 drops ( $\frac{1}{4}$  to  $\frac{3}{8}$  teaspoonful) of oil of anise; 7 lbs. mixed whole grains (not more than 2 lbs. of which should be field corn; no oats, since rolled oats are to be added later); 2 or 3 heaping tablespoonfuls of ground calcium carbonate, such as fed to livestock; 4 to 8 heaping tablespoonfuls of steamed bone meal; 21 lbs. commercial rolled oats, same grade as fed to baby chicks. **DIRECTIONS FOR MIXING:** Stir together the A and D oil, wheat germ oil, oil of anise and the cane molasses; pour in salt and stir until thoroughly dissolved in the oil; pour this liquid into the mixed grains and stir thoroughly for 2 to 3 minutes; add the calcium carbonate and steamed bone meal, stirring same through the entire mixture; next, thoroughly stir about 1 lb. or more of present grain mixture into 3 lbs. of rolled oats and empty into storage can, and repeat until grain mixture and rolled oats are all thoroughly mixed. A can with cover is preferred, since mice and rats are fond of this food and if permitted to contaminate it might bring disease into your hamstery. Any ingredi-

ents in the mixture may be altered experimentally. If rolled oats are unavailable, rolled barley is a good second choice. If neither rolled oats nor rolled barley may be obtainable, any mixture of either rolled or finely cracked grains may be substituted.

Should one wish to mix up lesser amounts, ingredients may be mixed up on basis of 1 lb. grains to 3 lbs. rolled oats, and other elements in the same ratio to them as in foregoing list of ingredients. With only a few pairs, one may wish to mix up only about  $\frac{1}{4}$  of the amount specified for each item going into the mixture.

Wheat, rye, barley, rice (unpolished), kafir corn, buckwheat, maize, and other mixed whole grains do well in this mixture. If available, cow peas, soy beans, and corn, all coarsely cracked or mill split, may be included in the mixture of smaller whole grains. None of the elements in the forcing feed mixture are expensive. All are procurable at most good poultry and small stock feed stores, with exceptions of oil of anise from the drug store and the cane molasses of cheapest cooking grade from the grocer.

Approximately  $\frac{1}{2}$  oz., or a well-rounded tablespoonful of this mixture is a good one-day feed per adult hamster. Breeding males, as well as bred females and nursing mothers, profit by use of this mixture instead of grain on the whole grain days in either feeding schedule in Chap. 27. If out of pellets, the mixture is a good substitute. In fact, some users prefer it to pellets for general use. To undersize weaned kittens it may be fed daily with green foods to help bring them to standard weight, an occasional moderate feeding of pellets added if desired.

**SUPPLEMENTAL NEST FEEDINGS:** For production of super-litters—maximum of either size or count per litter—the author recommends his practice since 1943 of using this mixture or some modified form of same for such purpose. Technique for usage: Beginning on about the 9th day after litter birth, for a litter of 10, approximately one level tablespoonful of the mixture may be placed on the top edge or rim of the nest, shown by S.F. arrow point in Illus. 31, so that part will spill down into the nest among the young; quantity may be increased daily in proportion to growth of young. BUT, likewise, on same daily basis, to aid in prevention of bowel trouble as well as to furnish essential balancing food elements, MUST be fed an equal or greater amount of water content vegetables such as potato, carrot, lettuce, etc. Such vegetables should be diced or cubed, not too carefully, to approximately  $\frac{1}{4}$ -inch pieces for the 9th day of age feedings, and increased to approximately  $\frac{1}{2}$ -inch pieces by 15th day of age. By the 14th day, supplemental feedings to a litter of 10 may be about 2 well-rounded tablespoonfuls of the mixture and equal amount of green food. After kittens are observed to have open eyes the supplemental feedings may be discontinued as the young then freely share the general pen feedings at F.P. with the mother. General feedings must increase according to her litter's needs. This technique may enable 21-day weaning of 10 to 16 kittens of 1 oz. or more apiece from mothers whose litters of same count without supplemental nest feedings might normally have been kittens approximately  $\frac{3}{4}$  oz. each. Supplemental feedings are always done through front door. Rear door is used only for nest inspections and cullings.

**Other supplemental nest feeding materials:** If difficult to provide ingredients for the forcing feed mixture, other food may be used as a second choice. Clean, cracked grains, or rolled oats; or cracked grains and rolled oats mixed may be used. No oil need be fed unless desired. But cut or diced vegetables should be fed in same manner as advised with forcing feed mixture. While this substitute lacks the rich minerals and vitamins afforded by the previous mixture, such supplemental feeding furnishes enough extra nutrition to tend to prevent kittens over-suckling the mother. Since their teeth are sharp, over-suckling may make the mother cross and rough with her kittens. Some mothers become cannibals when over-suckled to the point of desperation. Large commercial hamsteries, without 3 to 5 day nest culling or supplemental nest feeding, may have a high per cent of cannibalism and many low litter average production pens. Too little of the mother's milk per animal during the first 10 days under such mass production.

If desired, a glass castor glide, small size, as an additional waterer may be placed on pen floor about the 12th day of litter life and remain there until kittens are observed to use the regular watering device of the pen, longer if convenient. If available, whole milk for its nutritive qualities may be used instead of water in the castor glide. Such practice helps prevent large litters over-suckling mother.

#### **51. Handling for Profit.**

**HEAVIER STOCK:** A good field is opening for highly superior stock. It is doubtful whether the large commercial hamsteries may do much toward stock exceeding  $5\frac{1}{2}$  or 6 oz. until such handlers do more rigid selective breeding and early nest culling than has been in evidence thus far in stock shipped from the large commercial hamsteries. If one desires extra heavy males he may write various producers for prices and guaranteed weights on heaviest prime breeding males they may have available for sale and immediate shipment. One should remember that it is customary for the buyer to pay shipping charges on breeding stock.

For obvious reasons, higher education laboratory courses using small animals for dissection studies are seeking larger specimens of the Syrian Golden Hamster. Specimens  $6\frac{1}{2}$  oz. or over are uncommon; 7 oz. or over, rare indeed. A half-pound hamster, reproducing in that weight, would be ideal for such usage, and may appear in the not too distant future. It is a job for fanciers and hobbyists. The following discussion gives the pattern for weight improvement of major importance.

**Bring Sub-Standard Stock to Standard in Two Generations:** Suppose you now have only sub-standard, 3 to almost 4 oz. stock. First, buy one or more strong  $4\frac{1}{2}$  to  $5\frac{1}{2}$  oz. males. Next, select from your sub-standard females the largest ones with best production records. Mate them to this new male stock. Cull litters down to count of 5 to 7 as early as you may distinguish sex. Not later than the 7th day, cull litters again, down 3 to 4 each, keeping only the best. Use supplemental nest feedings as per Chap. 50. The likely mature weight is determined while young are still with mother. Leave kittens with her until 25 to 27 days age unless she fights them earlier. Under such practice, it is normal to obtain from  $3\frac{1}{2}$  oz. mothers young

maturing at 4½ oz., sometimes over that. At 12 or 13 weeks, mate the best of such young females back to their father, line-breeding for further increase in weight. This second generation should amply repay all effort involved. Older sub-standard stock not bringing young of desired weight may then be discarded.

Standard stock culled and handled in same manner, with or without line-breeding, produces maximum kitten to adult weights for improvement of such standard stock. After attaining desired weight for improved breeders, litters of 6 to 8 should mature to the adult weight and quality of select breeding stock; and litters of 10 to 14 should wean for highly satisfactory laboratory grade animals.

It is obvious that production methods of the larger commercial hamsteries, starting first matings at the early age of 8, 9 or 10 weeks, may not have time to follow such stock improvement schedules as suggested. The fancy stock may be had from the fancier able to devote personal time, instead of hired help routine care, to selective matings, culling and care of his stock. In most cases, he may have few enough production line animals to know them as individuals, and not just as such and such numbers on his record cards. Yes, it is from the small to medium fancier that we may expect the genuinely highly superior stock. He raises it by this pattern in litters of 5 to 6; sometimes less; rarely more. Less animals—true. But better profits and more satisfaction in higher price per animal of highly superior quality.

## 52. Exhibition Stock

Exhibition stock is not from a different breed of animals. To maintain or improve exhibition quality, females should be 3 to 3½ months of age for first matings. Handling is much the same as for standard to highly superior stock, seldom permitting weanings of more than 5 or 6 kittens per litter, 3 to 4 being preferred. Young are left with mother as long as possible. Young are sex separated upon weaning, and penned in groups until not more than 7½ weeks of age, when they are moved into individual pens to avoid possible torn ears or any scars from fighting. Only the selective mating method, one female placed in male's pen, is advised. Wait 8 to 10 days after weaning her litter before remating the mother.

Lose no opportunity to display such stock at fairs, pet shows, etc.

It is a good idea to buy exhibition stock from a hamstery you may personally visit to select such stock, or by mail-order from only those who advertise no other grade, and who ship exhibition stock with buyer's privilege of 1 or 2 days observation and return of stock for full refund of purchase price if dissatisfied, the seller paying Express one way. It is doubtless true that within a few months from publication of this book many large outfits will be offering so-called exhibition stock, seeing therein an opportunity to use another highly profitable outlet for their present commercial hamstery production. This is but one of the reasons why the buyer should have the protection of examining, weighing and observing such stock, and of returning same for refund if dissatisfied for any reason whatsoever.

As with other species, exhibition stock is characterized by superiority of breeding, handling and its

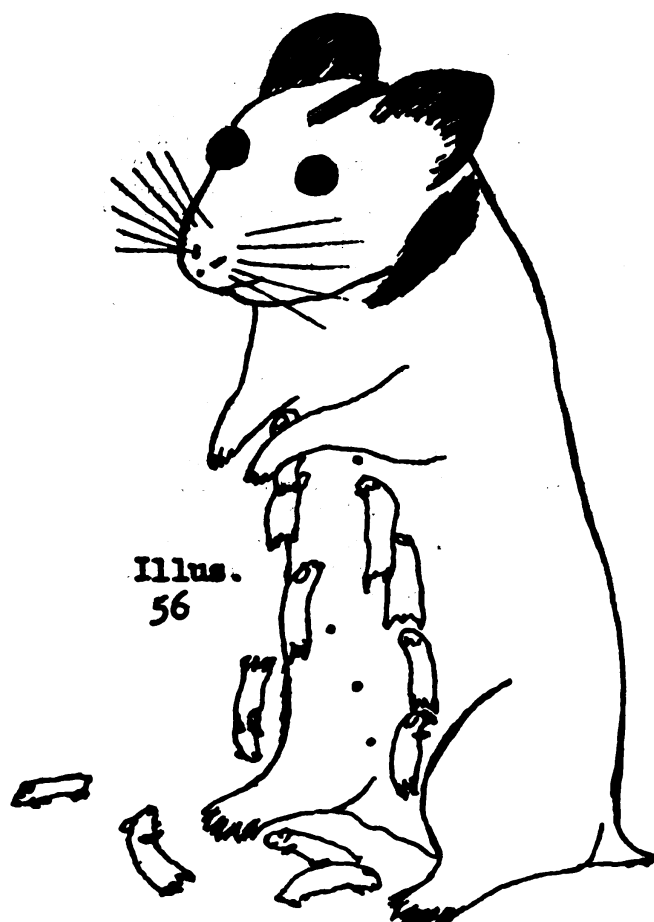
own behavior. Much individual handling, observation and care bring out notable traits peculiar to animals of such quality. Size is only one factor, but that is essential. Color and quality of fur, and sharp distinctions of individualistic behavior distinguish such animals from mass production specimens.

### 53. Prevention of Early Discards

Males and females that are mistreated, severely injured fighting or falling, or are improperly fed, make poor breeders. The bred female fed forcing feed mixture assimilates elements that do much for the bone structure of herself and young during those important days and that reinforce her milk supply for her suckling young. As previously suggested, with large litters milk shortage may trouble her to the point of resorting to cannibalism which automatically makes her a discard. Hamsters like whole milk from either cows or goats, but it does not take the place of water. A real small jar, face cream or any other about 1 to 1½ inches wide and about 1 inch high, placed in her pen and milk furnished daily from about 3 days before birth of litter until young are about 15 days old may greatly help both mother and young. Adult hamsters vary greatly in amount used daily. Use of milk is optional.

If necessary to be away, with no one to care for the stock for 3 or 4 days, hamsters do fairly well with ample supply of stored food, provided water supply continues. Bottle and tube waterers are especially valuable during such periods. The best type of green foods for such absences are whole potatoes, whole carrots, etc. The animals eat into them only as needed, and moisture content stands up well. These are good water content foods for animals in shipment as well as when left without daily care.

Do not annoy mother by handling her young in her presence before they are old enough that she has ceased returning them to the nest. In her defensive haste to remove them from your seeming molestation, her sharp teeth may break their tender skin, draw blood, then she may eat such and others later, making her a discard. Undue disturbance by close-up presence of cats, pawing or barking dogs, or noisy guests, may at times lead to the same misfortune. Instinctive reactions of mature females is clear. When placed in breeding male's pen, the instinct is either eating, fighting, or mating. One instinct rules each occasion. When you open her pen door, she responds with a definite instinct: eating, if you appear to be her friendly source of food supply; fighting, if she suspects you of endangering herself, her young, or her own food supply. For this reason, while rearing young, it is highly desirable that you help her to associate you only as her friendly supplier of food. If you feed her some, even if little, every time you open her pen door, she may become far more trustful than under indifferent treatment. It is disturbance and annoyance, rather than frequent attention, that really bothers the mother hamster. She relishes considerate attention after litter is approximately 4 days old so that young have ceased clinging to her mammae (nipples) as she leaves the nest. But, alarm or disturb her suddenly, during this critical early period, so that she rushes from nest too hurriedly to disengage the suckling young and you have a dangerous moment as shown in



Illus.  
56

**DANGEROUS MOMENTS:** Newly-born, nipple-clinging young, and mother (approximately 2/3 life size). Alarmed mother rushed from nest without disengaging nursing babies.

Illus. 56. She will return them to the nest, but they already may have been harmed by falling.

If they lack a guard board to know, and some hard items in their food to chew, hamsters' teeth sometimes grow so long that they may no longer eat well. Or, a tooth may be chipped or broken near the point while chewing at the hdw. cl. These conditions are infrequent, occurring only once in a while even in a large hamstery. All that is needed is a slight trimming of the tips of the teeth to make them even. Simply take the animal by the back of the neck to lift it up, and the mouth remains helplessly open for this painless nipping off the tips of teeth until they are even. As a rule, only a small portion of the tips need be removed, and this may readily be done with pliers. While the hamster bite is not severe, until one becomes accustomed to bare-hand procedures, the wearing of gloves during such handling of adult females may be advisable.

#### 54. Sanitation

Adult hamsters normally drink water in amounts of 1/8 oz. upward daily. Mothers nursing young use up to

one or more ounces daily. Disinfect, or wash with hot soap water, the water or milk jars as needed.

Standard germicides, disinfectants, and drinking water solutions used successfully with rabbits may be used with hamsters, although hamsters are remarkably free from native diseases peculiar to themselves. They are susceptible to disease, so if caretaker has common cold, he should wash his hands before tending or handling stock. Avoid dampness of nesting area, nesting materials and pen floors.

Being non-regurgitating rodents, hamsters may lick up nicotine or sulphur in sufficient amounts for fatality. Therefore, pyrethrins powders, without nicotine, appear best for lice, mites, and other insect control, if same may appear from association with poultry or infested small stock.

Clean pens, and the freedom from urine odors afforded by self-cleaning area in floors, make for satisfaction of hamsters, caretaker and visiting guests.

While nest culling may be satisfactorily done from the front door, the rear inspection doors afford ease of cleaning pens appreciated by those who care for the hamstery.

## IX

### MARKETING HAMSTER PRODUCTION

#### 55. Finding Your Markets

For many readers, this section may appear to be the most important part of the book. Why? Because no steady markets come to knock at your door unless you let them know you have a hamstery door at which they may knock. Furthermore, 24 productive females may wean from 1,000 to 1,250 young per year. Suppose you desire to sell 500 to 750 to laboratory use, 100 trios and 100 pairs for breeding stock and pets. That sells the 1,000 to 1,250. But, beginners who rush into that volume of production without looking to their markets, who expand without experience and business sense, play a losing game. Remember, that a large share of the current laboratory animal market is currently monopolized by the large commercials most anxious to sell you breeding stock. They are not creating markets for beginners. Each year thousands buy breeding stock with a short-lived hope of making a living, or at least of saving a nice sum. Most of these fail to recover their investments. But, they that have not spent enough to hurt have a lot of fun, and many of them continue the pleasurable hobby of raising these fascinating creatures. Many with good business judgment, patience, and willingness to use such advice as given in this book, are content with a hobby or small commercial hamstery for a side-line income and make a good year around profit selling breeding stock and pets, with or without laboratory sales.

Commercial hamsteries ship direct to users. Most hobbyists sell too large a per cent as breeders and pets to permit regular shipments of any considerable numbers to laboratory animal brokers. For these reasons, few brokers handle hamsters. Thus, the hamster breeder gets and serves his own markets, usually making the entire handling profit except when selling to or through pet stores, etc.

#### 56. Hamster Advertising and Literature

Before advertising or sending out circulars to institutions, one should decide whether he desires to enlist the help of a nearby producer to fill large orders. One needs 6 or more females in production to sell 6 laboratory animals weekly, 24 females to sell 24 weekly, etc. Such production should permit large enough weanings to select some breeding stock and pets before making laboratory deliveries. Some doctors use as few as one-half dozen per week. According to the business volume of each laboratory, animal usage runs from one dozen to many dozen weekly.

Where may one best advertise to bring in the hamster sales? One may begin with two classes of magazines: (1) A classified advertisement in a pet or small stock magazine. (2) A classified advertisement in one of the outdoor magazines. Outdoor magazines' classified rates are higher, but readers include hunters, trappers, fishermen, doctors, school heads, pet shops, laboratory men, hobbyists, and others in general among the best prospects for buying hamsters. Any outdoor magazine that has carried a hamster display (picture) advertisement for more than 6 months is considered a good business getter for the advertiser. An advertisement, giving price per pair, placed in its classified section, should pull sales. You get the benefit of the

other fellow's pictures, and probably sell at more reasonable prices. One advertisement in each class of magazines should furnish sales outlets for production from 6 to 24 females, depending upon your choice of magazines and size of your advertisements run in each, the outdoor magazine bringing the larger portion of sales. Advertising rates are usually in proportion to circulation. Later, if desired, one may advertise in the medical and laboratory journals.

**HAMSTER LITERATURE:** The hobbyist may hardly afford to have extensive special literature printed for himself. Whatever one has printed or mimeographed should be of the best quality obtainable at a reasonable price. Warning: Do not copy anything from circulars, magazines, or books that are copyrighted. In 1948, a professor in a large eastern university copied from one of this author's copyrighted publications and began selling such stolen material in mimeographed form through pet shops. At once, the material was recognized and presently the professor made out-of-court financial settlement with this author. In 1949, another person, one in the northwest, also smart enough to know better, followed a similar course and paid more for copying a few lines without permission. If you give essential facts as to your age-weight prices on breeding stock by pairs, trios, etc., and your terms of sale, you thereby furnish the data desired by most inquirers. To laboratories and hospitals, you may quote animals by the dozen, or by 25, 50 or 100, as you like, and state whether you prepay or sell f.o.b. your address. Such essential prices and terms may be typed, mimeographed or handwritten during the early stages of your hamstery development, using either printed or mimeographed lists later on. Carefully study price lists circulated by others to learn what others in the same field are doing.

**CIRCULARIZING PROSPECTS:** Study the prospects as to hospitals, laboratories, schools, taxidermists and pet shops in your territory, a radius of 100 to 300 miles, depending upon density of population. Mail them some impressive and honest but economical literature on hamsters, and include your laboratory animal prices. If you know your laboratory or hospital prospect already uses hamsters, no literature need be sent except a post card carrying your prices and terms together with a brief statement of your ability and desire to supply him or the institution with well-raised, healthy hamsters. The main reasons for a hamster user changing his source of supply are (1) To obtain better animal service—quality, promptness, etc. and (2) To obtain the same animal service, but nearer at hand or at a lower price. "Nearer at hand" is advantageous in special usage wherein animals are not housed at the institution but are procured only for immediate needs as scheduled. Such are good markets for the hobbyist, also highly interesting.

One may write a laboratory or hospital not known to use hamsters, and courteously inquire: Do you use laboratory animals? Have you ever used hamsters? Then state that you would be pleased to furnish a few free of charge, upon their request, for their convenience in evaluating the hamster's worth to them in their laboratory requirements. Such a venture may bring a steady customer, and may be worth two or three hobbyists going in on together if one has too small production to undertake the matter alone. Whether you offer to furnish 6, 12 or more free ani-

mals for their trial usage may depend upon the size of your hamstery, the size of the institution, and any other local considerations of consequence.

Write biological, hobby, novelty, outdoor, specialty and school supply firms, importers and all other hamster sellers except the commercial hamsteries, and offer to ship hamsters direct to their customers. Most of the foregoing neither raise nor carry hamsters in stock. Such outlets represent a wide, steady market in which even the hobbyist with 3 to 6 producing females may profitably dispose of his output.

### **57. Displaying Hamster Stock**

Lose no opportunity to display some of your best hamsters. Local grade schools and science departments in high schools are usually glad to have a neatly made cage containing hamsters placed in the school room for a week, month, or a semester. A group of young males are ideal for such display. In advance of your courtesy offer of such stock display, or of your call to sell stock, place suitable literature in the hands of the proper teacher or superintendent. A pet shop at first slow to buy hamsters to sell as pets may gladly show a cage of them in their window or display department and take orders from their customers. Some stores take a pen of males, and another pen of females, on trial, and sell them to their pet customers. As soon as the store sees that they sell, the hamster producer has a regular dealer outlet for production. Many producers have permanent pet store outlets for their production. One need not advertise if he has local laboratory and pet store outlets and produces accordingly. Parks like to display odd and strange animals, provided they are healthy and easily cared for such as the hamsters. Park managers may be approached on the basis of accepting a group of males as a gift, which may bring your name into the local paper as donor of the animals and thereby bring you customers from the readers of the paper. Displays at pet shows, fairs, etc., with your name attached to display cage, may bring an amazingly large volume of business. A feed store selling pellet feeds of any kinds that hamsters eat may be delighted to place a nice cage of hamsters in the window, your name as producer attached to the cage, provided they may also place a card nearby telling that hamsters eat pellet foods sold there. Displayed animals in such cages do well for considerable periods fed nothing but green vegetables and pellet food daily.

Aside from sales outlets just mentioned, one may sell preserved or pickled hamster fish baits advertised as such, as per Chap. 37.

It is profitable to look up the nearest successful taxidermists and let them know that you have hamsters for their use when desired. Curio and novelty shops, and gift departments in large stores may sell well-mounted hamsters, newly weaned to mature adulthood, especially during the holiday seasons. Sales are stimulated by some reference to the Holy Land, such as "Holy Land Hamsters," "Syrian Golden Hamsters, Domesticated in Palestine," etc.

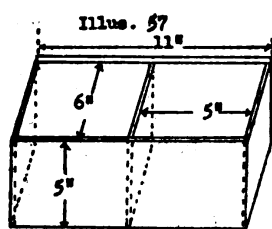
Magazine advertising interests unexpected sales prospects impossible to find as readily in any other way.

One's selling prices will be governed somewhat by figures quoted by other fair price producer-sellers.

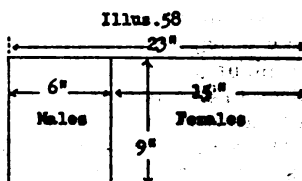
A convenient manner of getting one's name before a

large group of mail-order buyers is to contribute a brief article now and then to pet or small stock magazines. They like new writers, new names, different angles of the industry presented in each issue of their publications. Publishers know that a department becomes stale and unread after a few months of the same writer's opinions and experiences. Be careful not to copy any part of the work of others, as mentioned in Chap. 56, since such copying is dishonest and may be subject to severe penalty for infringement of copyright. Frequently some hobbyist or pet raiser discovers something really new that the publisher is glad to print in his magazine. Local and county papers are glad to print brief news articles, especially if with an interesting picture. All such publicity interests pet raisers and prospective hamster producers and tells them where to see and buy the animals.

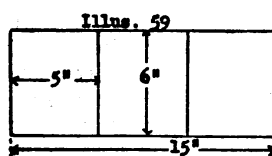
In several cities and towns, hamster raisers keep a cage or pen of hamsters in the front yard all summer long. Such pens vary in construction from the most simple living quarters to elaborate simulations of native life surroundings as in Chap. 38.



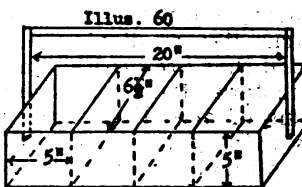
Crate for Adult Pair.



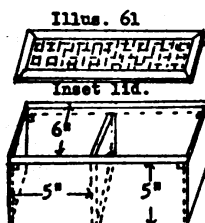
Crate for 2 Adult Males and 5 to 12 Females 3 to 5 wks. age.



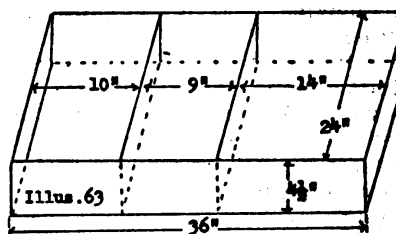
Crate for Trio, young or adults.



Crate for 4 Adults. 20\"/>



111. Crate built for 62 inset lid cover.



Flat tray-type crate for shipping laboratory stock, sex or age separate.

## 58. Shipping Crates and Care

Hamsters are among the easiest of all animals to ship, especially since they require no watering en route to points anywhere in the United States. One simply encloses in each compartment of the crate a supply of excelsior or grass for bedding, then moisture content food such as carrot, potato, turnip, etc., and grain, with pellets sufficient in amount for a longer time than trip may be expected to require.

Crates vary in construction. For shipment of newly weaned young, crates should be  $3\frac{1}{2}$  to  $4\frac{1}{2}$  inches high, and constructed of light-weight wood, with fly-screen or hdw. cl. tops. Fly-screen is easiest to handle; hdw. cl. lasts longer.

Illustrations 57 to 63 show varied types of shipping crate construction. Wood used is thin box material about  $\frac{1}{4}$  to  $\frac{1}{2}$  inch thickness. Partitions should be  $\frac{3}{8}$  inch, and ends of large crates or trays may be 1 inch. Drawings show construction before top is installed. Fly-screen or hdw. cl. top turns down about 1 inch over each edge to be fastened by carpet tacks. The handle attached to crate in Illus. 60 prevents other Express covering the crate. Illus. 61 shows hdw. cl. inset lid made to fit crate in Illus. 62. Illus. 58 and 59 show top view for dimensions only, and such crates may be  $4\frac{1}{2}$  to 5 inches high. Unless one desires crates returned, construction should be kept as simple as possible.

Be sure to use a shipping label indicating that contents are live animals and perishable, also that no watering is required en route.

In weighing hamsters for shipment, or at any other time, a No. 2 $\frac{1}{2}$  tin can is highly satisfactory. This can weighs approximately 4 oz. If less, a few drops of solder may be added to the bottom. If more, file or grind off enough from bottom rim to bring can to exactly 4 oz. This will save a lot of time otherwise wasted in figuring fractions, and is essential to any well-managed hamstery. A cheap, small postal scale with weighing range up to 1 or 2 lbs. is suitable for the hamstery.

A careful restudy of Part IX, "Marketing Hamster Production," plus the creative thinking of the reader, may suggest many sales possibilities in his area otherwise overlooked. These are the roads to take, the doors to open, and the wires to pull for the most advantageous marketing of hamster production.

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The author has no small stock or supplies of any kind to sell. He simply, but sincerely, wishes the reader well in both pleasure and profit with Syrian Golden Hamsters.

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